GAS JOURNAL

LIGHT ⁘ HEAT ⁘ POWER ⁘ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

PROPRIETORS: WALTER KING, LIMITED — OFFICE 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. — Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXXXV., No 3424] WEDNESDAY, JANUARY 2, 1929. [81ST YEAR.

In place of the customary "Editorial Notes," there follow, in this first number of the "JOURNAL" for the New Year (the eighty-first of its existence), nine contributions from Leading Administrators and Executive Officers in the Industry, in which they review particular phases of Gas Activity in 1928. It only remains for us, therefore, to acknowledge the valuable help these authors have given us, and to wish all our readers

Happiness and Prosperity in 1929.

Gas Engineering in 1928.

By GEORGE EVETTS, M.Inst.C.E., M.Cons.E.

It is rare that any structure or process involving new engineering features comes to the front in the gas industry in the short space of a year. Revolutionary methods are usually the result of gradual development; and the introduction of a simple process involving a new idea is not usually recognized as being of widespread importance at the time of its initial appearance on the market.

HOLDER DESIGN.

Though the year 1928 has witnessed many interesting features for the gas engineer, nothing completely new has appeared of outstanding importance.

Probably the most important and spectacular advance which has been made relates to gasholders. The waterless holder has made remarkable advances in Great Britain, and during the year orders have been placed for one 8-million c.ft. holder of this type, as well as two or three 5-million ones—probably a record in this country for large structures of a new type involving fundamental changes from previous design. Apart from the actual orders placed, the type has been discussed by engineering enthusiasts, and was honoured as a topic of discussion before the centenary meeting of the Institution of Civil Engineers in the Gas Section. In addition to this particular type, the Hortonsphere has been formally introduced to the British market, and British firms are now under licence to manufacture it. The Hortonsphere has distinct limitations of size as compared with the waterless type, but is likely to fulfil requirements where conditions are favourable to its particular good qualities. The good points of these two types or the conditions favourable for their construction need not be dealt with in this article. They have been ably put forward by their respective sponsors.

A second type of "piston" dry gasholder has also been introduced to the notice of gas engineers. The invention has been tried out on the Continent. This pattern is round, instead of polygonal, and the gas is prevented from escaping by means of a stuffing-box device, instead of by means of a tar seal carried in a canvas "cup."

CARBONIZATION.

With regard to carbonizing, the various methods of vertical carbonization in the mass are still making progress. Vertical retorts are being improved in two principal directions—first in dealing with various qualities and sizes of coal, and secondly in relation to the refractories in the setting. It is claimed that the capital cost of verticals per therm of gas produced is now as low as that of horizontals for large installations, and the repair costs are being reduced with the same end in view, though that point has not been reached yet.

Vertical chamber ovens are also claiming more attention, and threaten to become serious competitors of vertical retorts. One installation in a London works is a success, and schemes are now being put forward for medium sized works. The combination of outside producers (using low-grade fuel) with cleaned gas in the settings (causing reduced wear and tear on refractories) is worthy of serious consideration.

Low-temperature carbonizing is also receiving a large share of attention, and references have been made to three plants in the London area. These units are probably erected partly for experimental purposes, seeing that they are not necessarily favoured as cheap gas producing units. Their success will depend on the saleability of the semi-coke produced; and the hitherto principal product (gas) becomes of secondary importance.

Another noticeable feature in carbonizing is the greatly increased importance of waste-heat recovery. Few engineers to-day think of vertical retorts without the addition of waste-heat boilers, and water gas plants are receiving considerable attention in this respect. There are water gas plants in operation now getting nearly all, if not the whole, of their steam requirements without external assistance.

Incidental to the carbonizing problems, we have increased quantities of coke oven gas being taken from sources outside the gas-works; and this will probably continue to grow in view of the attention now being paid to it, in connection with the general review of our fuel and power resources. The National Gas Council have officially in-

vestigated conditions in the German coalfields, and the report issued by that body puts the relation between the gas and coke oven industries in the right perspective. Attention has already been drawn to the fact that as much coke oven gas will shortly be taken in this country by gas undertakings as is at present sold in the Ruhr—a fact which very few people realize.

Complete gasification has made some progress, but it has not been marked by anything spectacular in 1928. It will continue to attract attention where residual receipts are not an important element in the cost of producing gas, but the thermal balance of most plants is not yet good enough to counterbalance a yield of 60 p.ct. or upwards of the cost of the original coal for the return of secondary products. At the same time, results have been recorded under working conditions which show a distinctly better thermal yield than complete gasification in two stages. There is room in the small works for an efficient complete gasification plant which can successfully gasify the resultant tar and further enrich the gas up to 400 B.Th.U. or more.

PURIFICATION.

There is nothing of importance to record in dry purification plant or processes, but in wet purification the number of new naphthalene washing plants and dry gas plants has been considerable, and almost all appear to have been successful. An effort is being made to amend testing conditions to compensate for this new condition. In connection with the drying process, the oil filming of gasholders, both inside and outside of the tank, has become necessary. In fact, oil filming has been increasingly practised, apart from the installation of special plants, with the dual object of preventing excessive moisture and preserving the sheets of the gasholders.

Reinforced concrete continues to increase in popularity for foundations and structures where strength and resistance to corrosion are essential qualities. Concrete purifiers have not made any marked progress, probably because they show very little saving as compared with cast iron, and the life of the latter is sufficient for all practical purposes. It is generally found that purifiers and similar plant must be abandoned on account of deficiency in size long before the end of their physical period of life. Corrugated iron is rapidly disappearing as a covering for roofs and buildings. Asbestos cement preparations now hold the field.

There is very little to record in regard to coal and coke handling plant, though increasing regard has been paid to coke grading plants and ash separation. The problem of providing a saleable coke will continue to demand serious attention; and it is likely that plants for the blending of coal will come into prominence in the near future.

METERS.

With regard to the measuring of gas, further progress has been made with various measuring devices which avoid the cumbersome and costly rectangular station meter. The great asset of the rectangular meter—accuracy—has hitherto kept this pattern to the front; but other devices are now being perfected which occupy less space and are lower in initial cost. The degree of accuracy is being so rapidly improved that there is no doubt that their use will be greatly extended.

A YEAR OF CONSIDERABLE PROGRESS.

The result of the inquiry into the Manchester gasholder explosions is unsatisfactory in so far as no definite reason can be given for the disaster, and up to the present no useful indication has emerged which will avoid the repetition of similar troubles in future. The Committee formed by the Institution of Gas Engineers to consider the design and maintenance of holders may be able to formulate such practical recommendations as will improve the life and stability of these structures in the future.

On the district, the use of district holders is rapidly assuming the importance deserved by these useful pieces of plant. Linking-up and high-pressure schemes are growing in numbers and importance.

On the whole, therefore, the year has been one of considerable progress, and there has been, if anything, an advance in the speed of assimilation of new ideas in plant, processes, and administrative improvements.

Distribution and Sales.

By R. J. ROGERS, Chief Superintendent, Fittings Department, City of Birmingham Gas Department.

During 1928, on several occasions attention has been directed to the nearer advent of the transmission of gas over greater distances than has hitherto been the practice in this country. The principal factors which are likely to affect our distribution practice are

(*a*) The situation of the coal mining industry.

(*b*) Impending legislation in the gas industry.

(*c*) Legislation respecting the laying of mains in highways.

The year 1928 has drawn to a close with a heavy cloud hanging over the coal mining industry. The unemployment situation in the coalfields has reached a point where the Cabinet has agreed that drastic action to stimulate revival of the industry is imperative. How far any steps to be taken by the Cabinet in dealing with this intricate problem will affect the gas industry as a whole, and distributing engineers in particular, is at the moment only conjectural. In the event of any schemes being put into operation whereby coal is carbonized near to the collieries, the problem of the transmission of gas to distant points of consumption will require expert consideration by distributing engineers.

The long-overdue legislative measures which the gas industry is endeavouring to urge upon Parliament have been brought a step nearer realization during the past year. Distributing engineers will particularly welcome remedial legislation so far as it affects the laying of mains and cables in the highways to suit modern conditions—a subject which has been succinctly dealt with in the columns of the "JOURNAL" by Mr. R. W. Edwards, Chairman and Managing Director of the Aldershot Gas, Water, and District Lighting Company.

The prospects of fusion or amalgamations between gas undertakings in the near future will create interesting problems for the distributing engineer to solve. A careful study, therefore, of the cost of compression and transmission of gas is necessary; and in this connection mention must be made of the invaluable paper contributed by Mr. Stephen Lacey, B.Sc., to the Institution of Gas Engineers at the annual meeting in Cardiff. Valuable information on "The Transmission of Power" was given in the three papers comprising Section "O" of the Fuel Conference held in London last October. Dr. E. W. Smith is of opinion that there is a limited distance beyond which it is cheaper to rail coal for gas-making than to convey gas and the coke which is absorbed in the same area as the gas. Many local conditions, however, must be taken into account before a decision of this kind can be made.

The Ruhr Scheme in Germany, in which coke oven gas is being transmitted to distant towns, will be watched with interest by British distributing engineers, particularly with regard to the type and length of main, joints, &c., which are being used. It would appear, from a consideration of the Section "O" reports, that the technical problems of long-distance gas transmission may now be regarded as solved. The paper by Mr. H. V. Lloyd-Jones reminds us, however, that there are considerable legal difficulties to be overcome in Great Britain before long-distance transmission of gas can be undertaken.

The question of protection against stray electric currents and corrosion still remains more or less unanswered. This subject is receiving the attention of a Sub-Committee appointed by the National Gas Council.

SERVICES.

With regard to service pipes, the specifications for wrought-iron strip, tubes, and fittings adopted and recommended by the Council of the Institution of Gas Engineers in February, 1927, are now well known. Engineers buying to this specification will no doubt be ready to regard a proportion of the increased cost, as compared with steel tube, in the nature of an insurance. Those not so buying will do well to remember that a quantity of steel tube of foreign manufacture is on the market, and also steel tube which, though produced in this country, is made from foreign steel strip. Quality for efficiency, so

far as service pipes are concerned, should justify engineers to "Buy British Goods."

The continued development of housing schemes still involves gas undertakings in considerable expense in the extension of mains and services. Distributing engineers may find that where, as is the case in many housing schemes, houses are set a considerable distance back from the road, economy may be effected by the use of one service to serve two or more houses. In such cases a "joint service" badge should be put on each service near the meter inlet. This will prevent any possibility of accident in future years when gasfitters may be called upon to clear services.

This question of services leads one's mind to the consideration of meter positions. While meters to-day are carefully positioned, yet in many areas there remain service pipes which run under boarded floors. Every effort should be made to have these replaced in such a way that there can be no possibility of uncontrolled gas accumulating under the floor cavity when leakage takes place in the service pipe.

High-Capacity Meters.

The adoption of high-capacity meters is a matter which has engaged the serious attention of engineers during the past twelve months. There appears no reason why, if special care is taken with regard to small matters of construction and the circumstances in which they are fitted, these meters should not serve a very useful purpose; but some uniform policy needs to be followed in the nomenclature of these meters, and the present practice of badging them with the maximum capacity per hour is, in the writer's opinion, open to objections. At the present time meter manufacturers are producing and stocking meters which, though of the same external case dimensions, are badged in three different ways—viz., light size, standard size, high-capacity size. There can be no doubt that, while present conditions prevail of making three meters where one should suffice, the tendency is to keep the price of meters higher than necessary. The writer has on several occasions during the past year directed attention to this matter, and considers that the time is now opportune for the Institution of Gas Engineers to convene a conference of buyers and makers of meters to discuss this matter with a view to arriving at a uniform method of badging meters.

Inferential Meters.

The adoption of town gas for heating processes in large works brings into prominence the possibility of the use of some type of inferential or rotary meter in place of the larger sizes of positive meters, which are expensive to purchase, and, with certain types, expensive to maintain, and which occupy a great deal of valuable floor space. The industry will be interested to learn how the newer type of meter behaves on the district; and it is hoped that any engineers using such will take every opportunity of giving publicity to the results of their experience.

Gas Charges.

Engineers look forward with interest to the issuing of the report by the National Gas Council upon the findings of the Committee on the question of gas charges. None can afford to ignore this question, though wide divergence of opinion is bound to obtain as to the best method of rendering equitable existing flat rate methods of charging.

Heating Load.

There is apparent in the minds of engineers a growing realization of the vast amount of heating load which is as yet untouched. The gas fire in the occasional room is all too occasionally used; and if we are to have a profitable heating load, a new outlook upon gas as a fuel is required in the minds of many consumers. We must not rest satisfied so long as gas is regarded as a stand-by to other methods of heating and cooking. It would almost seem that a more pressing problem than that of obtaining new consumers is that of increasing consumption from those existing. We perhaps need to be more dissatisfied. We see a steady small expansion in business, and think all is well. There must be many cases where a 20 p.ct. increase in gas consumption over the supply area would considerably reduce the cost of production. Money spent on analysis of methods of increasing the average consumption per consumer and on the adoption of a sound business-getting service would in such instances show excellent return.

Panel Heating.

While the full exploitation of existing heating methods is essential, any development of new heating methods will, of course, be of the highest interest. Prof. Barker has already made public his method of radiant panel heating, and there is little doubt that this or some other adaptation of low-temperature radiant heat will assist the gas industry in securing its fair share of the heating load.

Water Heating.

The past year has seen the commercial development of that type of storage water heater taking a small continuous consumption; and this will be welcomed by many engineers, who will find in it a means of obtaining a regular increased demand off existing meters and services. This type of heater should be favourably considered by the industry, as it gives increased consumption without the increase in capital costs for larger meters, &c., necessitated by many other water heating methods.

Cookers.

Twelve months ago many engineers were doubtful whether the new all-enamelled cookers would stand up to actual working conditions. A year's experience will probably have put these doubts at rest; and engineers to-day will have little hesitation in including this type of cooker on their lists of hire-purchase apparatus.

Geysers.

The increased use of the gas geyser has focussed attention upon the constructional faults that exist in some makes on the market, and still more upon the very unsatisfactory manner in which they are fixed. The Ministry of Health has taken an interest in this question, and the Gas Safety Committee has been asked to issue recommendations for the guidance of the industry. It is anticipated that this report will be issued in the near future.

National Testing Laboratory.

The maintenance question in its different aspects has received considerable attention during the past year, and deliberation upon it makes very apparent the need for a National Testing Laboratory which would enable engineers to avoid those fittings and appliances which tests showed to be unsatisfactory or high in maintenance costs. As things stand at present, the smaller undertaking at any rate can only find out the faults or merits of particular appliances by experience, which is a very expensive method of obtaining knowledge.

Gas Service and Public Goodwill.

Full recognition of gas as a domestic fuel will only be possible when all architects are fully acquainted with the very great advances which have been made in the design of cookers, fires, and water heaters during the past few years. It is therefore encouraging to note the *rapprochement* that has taken place between the architectural profession and the gas industry during the past year. At the same time the architects' desire for beauty of form and appropriateness of layout must not be allowed to interfere with those practical requirements as to ventilation and supply, on which the satisfactory working of the appliances depends.

Improved relations with architects are only part of the wider question of improvement in our relations with the public. A sound sales policy calls for co-operation between all sections of the undertaking's staff. The benefits of national advertising and publicity campaigns are only appreciated to the full by those undertakings which, in addition to economical carbonizing plant, have an efficient distribution system which will give adequate and steady pressure, up-to-date showrooms, well-trained fitters—in short, a staff who fully realize that their own welfare is bound up with the prosperity of their undertaking, and that the prosperity of their undertaking is dependent on the goodwill of the public.

Chemical Retrospect for 1928.

By Dr. W. B. DAVIDSON.

The very marked activity in chemical research in connection with the gas industry to which we have become accustomed in recent years appears to have been well maintained during the year now ended; and though there do not appear to be any striking achievements to chronicle, one cannot but admire the high standard of work—of both a practical and a theoretical character—which has been brought to bear on the various problems undergoing a possible solution.

AMMONIA.

One may reasonably conclude, from a perusal of papers written on the subject of sulphate of ammonia and that of effluents, that further improvements in the manufacture of the best salt under the best possible manufacturing conditions are still present in the mind of the expert in this branch of chemical engineering, despite the depressing commercial outlook. The output of sulphate from gas-works in the United Kingdom has experienced a decline in recent years, no doubt due to the fact that there is no longer any profit accruing to the small gas-works either in the sale of ammoniacal liquor or in the manufacture, *in situ*, of sulphate; the low selling price of the finished product (owing to the great expansion of manufacture of synthetic nitrogen products) and the high cost of sulphuric acid having brought this about. The result is that small gas-works are inclined to get rid of their ammoniacal liquor in the best way they can—by fertilizing local fields, for example. There is, of course, a limit to such expedients; and one may be sure it will continue to be necessary for the moderate sized, as well as the large, gas-works to deal as usual with their ammonia, whether this be worked up on the individual works or sold to a neighbouring chemical works.

If it be true that the conversion into sulphate does not yield any profit even on well-designed and well-operated plants, we must conclude that ammoniacal liquor of 2 p.ct. (10 oz.) strength is practically valueless. If and when this point is definitely reached, we shall be surprised if the field of liquid purification (by means of purified ammonia solution) is not entered by the enterprising engineer who can find cheap enough steam for a systematic distillation of ammonia liquor whereby sulphuretted hydrogen, carbon dioxide, and possibly also carbon disulphide, are continuously eliminated to such an extent that oxide purifiers other than catch boxes are dispensed with. It is an ill wind that blows no one any good; and the attention to other possible uses for ammonia thus enforced on the gas engineer may eventually result in an improved town gas, for no one can gainsay that a large reduction in the content of carbon dioxide and carbon disulphide would prove to be of enormous benefit to gas consumers.

The Liquor Effluents Research Committee of the Institution of Gas Engineers have carried out valuable investigation work on the elimination of the various toxic constituents that are to be found in ammonia liquor—tar acids, thiocyanate, and thiosulphate. Their recommendations appear worthy of serious consideration. L. H. Sensicle recommends the adoption in gas-works of the direct-recovery methods practised on coke oven works. We think with P. Parrish that the balance of opinion will be against this proposal, which would lead to further and unnecessary degradation of town gas.

DECLARED CALORIFIC VALUE.

Of the 651 gas undertakings known to us to have declared a calorific value, there are only a few which have made an alteration in gas quality during the past year. The chief accessions in numbers have been eleven to the ranks of the 500, and seven to those of the 400 B.Th.U. standard. If we work out a straight average from the latest figures, having regard only to the numbers and not to the sizes of the undertakings, we find that 474 is the figure sought. This is practically the same standard as that shown by the large provincial undertakings, Birmingham and Liverpool—475. Taking into account, however, the fact that the Gas Light and Coke Company have a standard of 500, and the South Metropolitan Company one as high as 560, the true average declared calorific value of the town gas supplied by the 651 undertakings is about 483. The probability is that this figure is now fairly well stabilized; and this fact is a striking commentary on the ideas of gas experts of only a dozen years ago whose opinions at that time were very much against any reduction below 555 gross (500 net) as being inimical to the best interests of the gas industry, especially so far as concerned industrial heating. One lives and learns.

CARBONIZATION.

Several noteworthy contributions have been made to the science of carbonization during the past year. Papers, embodying the results of researches recently carried out at Leeds under the direction of Prof. J. W. Cobb, are of great theoretical value, whatever commercial profit may in the future result therefrom. Studies of the effect of temperature, size of coal, and blending, and the continued investigations regarding the influence of inorganic constituents in the carbonization and gasification of coal as regards the liberation of sulphur, are among the subjects treated. The Carbonization Conference held in Birmingham in February produced several interesting papers and important discussions which are bound to be productive of much benefit to the carbonizing expert.

"A Review of Low-Temperature Carbonization," by F. S. Sinnatt, given in February last, is of special value to the growing numbers of people who are interested in low-temperature working. The results, and especially the balance-sheets, of the new large-scale installations, particularly those adopted by the Gas Light and Coke Company and the South Metropolitan Gas Company, will be awaited with patience, as it takes considerable time, owing to fluctuations in prices, to come to a final conclusion regarding the commercial value of the different processes under test. The biggest project so far mooted in this country is one for the low-temperature carbonization of 5000 tons of coal per day on Tyneside. Though this has been hailed in the newspapers on two occasions recently as the salvation of the local coal industry, one cannot help feeling dubious about this ambitious scheme.

COAL.

The sampling and testing of coals of all kinds is a subject that has been tackled during the past year by a large Committee working under the auspices of the British Engineering Standards Association. To our knowledge there have been great divergences of opinion with regard both to methods of sampling and to analysis or assay. A final settlement of the whole subject need not be expected for some considerable time.

TAR.

The Standardization Test Committees which for the past eighteen months have been considering methods of testing and sampling tar, tar oils, and motor benzole have nearly finished their labours, and we may expect the issue of a report in the spring of 1929.

Coal.

By F. J. BYWATER, of the South Metropolitan Gas Company.

National adversity has always proved a blessing to a strong people; and we in the gas industry sincerely hope this will soon prove true of our friends on whom we rely for our coal. For over a hundred years the raw material of our industry has been supplied to us by the combined ventures and strenuous efforts of colliery proprietors and their engineers, backed by sturdy miners toiling in the bowels of the earth, often in great danger and under many difficulties; and whatever be the merits of the quarrels which have torn and distracted them from time to time, or the reasons for the serious troubles which still persist, we shall not withhold our sympathy or hesitate to send them a message of hope that the fortunes of all concerned may soon improve.

The many and various troubles of the coal industry during the last ten years are known to all of us; but as the measures now being taken in some districts to remove those which remain affect our own industry, it may be useful to state briefly what these troubles are. According to a recent report of the Ministry of Mines, the fin-

ancial results of the coal industry from the resumption of work after the stoppage in 1926 up to June last reveal a total net loss of no less than £11,184,000. Having regard to the fact that the miners returned to work after that stoppage on the owners' terms, and that as a result labour costs and output per man employed have materially improved, these figures are indeed serious.

In connection with the loss per ton of coal raised in the various districts, which is reported in the Press from time to time, it should be understood that some of this loss is not actual, but loss of profit. All the large coalfields are working under agreements which standardize profits in the proportion of 13 p.ct. to 87 p.ct. wages, or in some 15 p.ct. profit to 85 p.ct. wages; and if the proceeds of the industry are not sufficient to pay the miners their standard wages, the deficit has to be found by the owners, and the loss then recorded is this deficiency *plus* the loss of the standard profit. Even so, the financial results reported by the Ministry of Mines are sufficiently serious to indicate not only that colliery proprietors are obtaining no dividends, but that they are called upon to make up serious losses. If such a state of affairs as has gone on for the last eighteen months, and for some time prior to the stoppage, is unchecked, it must result eventually in widespread bankruptcy. The causes of the loss incurred are mainly two—a greatly reduced export trade, and the continued fall in the price of coal due to international and economic influences on the Continent. The principal of these are as follows.

Causes of Coal-Getting Losses.

Owing to debased coinage in France and Poland, the wages of the miners and the standard of living there are very much lower than in this country. For instance, the wages in Poland are approximately half those of the British miner. Under the Treaty of Versailles and the Dawes Agreement, enormous quantities of coal are now being supplied by Germany to France and Italy—greatly to the detriment of British exports to these countries. The loss to Germany of the coalfields which after the war became incorporated in the new State of Poland caused her to develop her other Silesian coalfields and her enormous deposits of lignite. According to a recent report of the Department of Overseas Trade, the output of coal and lignite in terms of coal now exceeds that of 1913 by 27 million tons per annum in post-war Germany. Before the war all the coal now known as Polish was absorbed in Central Europe; but now Germany prohibits the importation of practically all this coal, which has had to find another market. Fortunately for Poland, our own 1926 stoppage gave her an opening to invade the Scandinavian market, which had hitherto been largely supplied by British coal, and this year Poland is sending there nearly 5 million tons. Before the war we supplied Russia with nearly 6 million tons of coal, but this market has now almost entirely disappeared. In Germany there exists a licensing system for imports which has been largely the cause of our exports to that country falling to a little more than half of what they were before the war. The Spanish market also is now protected; and this has resulted in a large falling-off in the importation of British coal. Hydro-electric schemes have developed in Europe which are estimated to be equal to a coal equivalent of 27½ million tons, and the world oil production has increased from a coal equivalent in 1913 of 66 million tons to 216½ million tons in 1928. Finally, while the coal demand is being heavily lost to these two competitors for railways and ships' bunkers, and all other industries are using fuel more economically, the world output of coal is increasing.

This is only a bare outline of some of the difficulties which the British coal industry has had to face in its export trade; and it is not hard, therefore, to account for the fact that last year our exports were only 49 million tons, compared with 73 millions in 1913. Yet every other coal producing country, except our own, is selling more coal, and every country has been exporting recently at a loss. Could anything be more unsatisfactory for the British industry?

Selling Schemes.

Meanwhile, during this year, coalowners in South Wales, Yorkshire and Lancashire, the Midlands, and Scotland have formulated various schemes for the purpose of stabilizing prices and improving exports. It is unnecessary to refer to these in detail; but generally all have for their object the subsidizing of export at the expense of the home trade, and only one includes among its objects the closing-down of uneconomical pits. It is estimated that coal exports from the Humber are now subsidized by 4s. per ton; and the export trade, particularly to Germany, is being increased thereby. It is very significant, however, to read in a recent report of the British Consul General at Munich that British coal was being supplied to South German gas-works at 4s. per ton less than the same quality German coal could be supplied! These schemes have been described by economists as unsatisfactory by themselves; and whatever the ultimate aims may be, it does not appear that, as at present constituted, they will solve the difficulties of the British coal industry. Apart from the dissatisfaction of the home market, which is sure to be vented, they are already resulting in reprisals from abroad. German coalowners have raised their subsidy to coal quoted for contested areas—*i.e.*, where foreign coal can be obtained—to 6s. per ton, and have secured a reduction of 2s. 4d. per ton on all bunker coal transported from the Ruhr to Hamburg, following this up by a request that this reduction should apply to all export coal. Now they are preparing a demand that the Government should introduce a derating scheme similar to that at present before the British Parliament. Polish coal is transported to the Baltic shipping ports at a rate which is estimated to include a subsidy of 5s. per ton. If this sort of thing is to continue, what hope is there for a settlement of this difficult problem by subsidizing our own exports?

It would be an unwarranted intrusion to suggest here any possible solution; but Lord Melchett, who has large coal interests as well as being a great industrialist, recently stated in an address to the Institute of Fuel that the coal problems of the world are one, and that the main factors in the re-establishment of the coal industry in this country on a sound economic basis are internal re-organization in technology and commercial direction, labour relations, and the closing-down of uneconomic units, followed by imperial and international re-organization and agreement.

But where we are entitled to express an opinion is in the bearing which the schemes so far formulated have, or will have, on the prices of coal supplied to the gas industry. It is a matter for serious concern to us to have heard frequently expressed in recent months, by coalowners and others, the view that the gas industry could very well afford to pay from 1s. to 2s. per ton more for its coal, as it has a monopoly, and can readily pass on the extra cost to its consumers. Nothing could be more misleading and mischievous than this suggestion. Practically every gas company and undertaking in this country has to meet the keenest competition in everything it sells; and it is of vital importance that its raw material should be obtained at open market prices. It supplies light, heat, and power to a vast number of other industries; and it is only by the use of modern plant and appliances, coupled with scientific research and alert salesmanship, that it has been able to maintain itself in a thriving condition. Why should the coal industry charge the home trade more for its coal, and itself engage in cut-throat competition for the supply of cheap coal to the foreigner, who is thereby enabled to manufacture cheap goods with which to invade our own free market, or to produce cheap coke in competition with our own exports?

If this trend of the present schemes of reconstruction is maintained, it will inevitably result in constant irritation and great injustice being done to the oldest and best customers the coal industry in this country has ever had, and will almost certainly lead to an extended use of water gas and oil by gas companies.

If the wholesale re-organization which Lord Melchett states that the coal industry requires is carried out, and if it should result in the better grading of coal seams and the supply of entirely suitable and cleaner coal to all industries, a higher price would probably be justified all round, for, despite what is done elsewhere, it is beyond question that the average quality of British coal is the finest in the world, and would command in competition

with others a higher price if it was always thoroughly cleaned and of uniform quality. But the gas industry will not cease to protest at being penalized in order that cheap coal may be supplied to the foreigner. All it asks is a fair field and no favour.

Bye-Products in 1928.

By W. G. ADAM, B.A., F.I.C., M.I.Chem.E., Superintendent of the Gas Light and Coke Company's Bye-Products Works, Beckton.

In spite of a 34 p.ct. increase in the world production of nitrogenous fertilizers, the price of sulphate of ammonia has only fallen some 7 p.ct. during 1928. This result is undoubtedly due to the efficient organization of the industry, which has materially assisted in bringing about a sufficient increase in consumption to take care of the increased production. In this country a record production and a steady home consumption have led to a record export figure of over 300,000 tons during the fertilizer year. We have practically regained our market in the Far East, and this is now nearly up to the pre-war figures. In the markets nearer home, Spain has taken 70 p.ct. more than in the previous year. These results have been secured by an efficient selling organization, successful agricultural experimental work, and by the improvement in the quality of the product shipped to these markets.

As regards the general quality of the bye-product sulphate now produced, though this has very much improved during the last few years, considerable trouble is still being experienced with caking of the sulphate in storage. Until makers are able to turn out this material in the best crystalline form, this fault will not be overcome. The chief offenders in this respect are the makers who use the direct and semi-direct processes producing a fine flour crystal. It is highly desirable that these makers should find means for producing a quality which will not set hard, and thus involve heavy cost for reconditioning.

The World Power Conference, 1928, again emphasized the position of the smaller bye-product works in respect of high costs of production and the disposal of the effluent liquor. Suggestions as to the advantages of anhydrite in place of acid were made; but these are not of sufficient magnitude to warrant the change-over. No solution of the effluent question has been evolved; and this problem is such a complicated one when the effluent liquor stage is reached, that it would seem that the easiest solution will be found at an earlier stage in the carbonization process.

Decreased consumption in the briquetting trade has undoubtedly accounted for the big fall in the price of pitch from the neighbourhood of 80s. per ton early in the year, to the present price of about 42s. The consumption of road tar has somewhat increased, but there is still a great necessity for further increases in the use of this material in order to take further quantities of pitch off the market.

The creosote position will be affected in the near future by the rapid technical progress in tar distillation methods. Tube or pipe stills have been developed rapidly during the last few years, and have been brought to a perfection which shows considerable economies in labour, fuel, and repair costs over the older systems. In addition, a further advantage is obtained by the use of these from the fact that lower yields of pitch and increased yields of oils are obtained. In Germany the tendency is towards larger intermittent stills, worked under vacuum, giving close-cut fractions, but at the sacrifice of increased yields of pitch. In France, a rapid increase in the employment of the Ab-der-Halden system has taken place; and though the fuel costs are somewhat higher, the yield of pitch is low, and good fractionation of the oils is claimed.

The outstanding feature of the year is, however, the development of the direct system of distillation evolved by the Barrett Company, in America. This utilizes the sensible heat of the gases issuing from the ovens to effect the distillation. The system is working on a number of plants on a unit size of about 40 tons per day, and further plants are in the course of erection. Though the fractionation obtained is not good, the system will undoubtedly be improved in this respect. The hardest grades of pitch are produced with ease; and under the conditions prevailing in the U.S.A., the system shows great advantages over the older processes. Its influence on the production of creosote in the United States, and the reaction on the European market for this product, are likely to be far-reaching. The process makes it profitable for the tar producers to distil the tar instead of burning it for fuel, as is at present done with approximately half the annual output of upwards of 600 million gallons of tar produced in the U.S.A. The production of creosote in the latter country in 1927 was 77 million gallons, and the consumption 173 million gallons; the difference—96 million gallons—being imported from Europe. The American output is obtained by the distillation of about half the production of tar, so that the potentiality of the direct process is a serious menace to the industry on this side of the Atlantic. As in the case of pitch, the easiest solution of the difficulty is in the extension of the use of road tar. The home market for this product is still far from saturated, and the efforts of the British Road Tar Association in this direction are worthy of the full support of the industry. There is no doubt that much work in the direction of propaganda and research remains to be done; and with sufficient means at its disposal, the Association should be able to take these in hand.

As regards refined products, a marked price improvement for white spirits developed in May, and a good demand has been maintained throughout the year. Crystal carbolic has continued a good market with increasing consumption. Liquid carbolic acid, owing to over-production, has fallen considerably in value, and is now a dull market. Naphthalene has shown improvement in output, but with relatively small increases in the value, while pyridine and other bases, and anthracene, continue to be difficult to place; and show practically no profit.

This review would not be complete without a reference to the developments in low-temperature carbonization, and the effect on the coal tar industry of the possible increased production of low-temperature tars. At present the relatively small production of these tars is being absorbed on the Continent principally by the new high-pressure processes for which they are particularly suitable. This is likely to be an expanding market, and one where it will rival coal tar. In Great Britain the present production is finding a market by devious courses for special uses at prices, to the final consumer, similar to the export prices for creosote. Should the production largely increase, as is possible, in the near future, these outlets will be quickly saturated, and new outlets will have to be found.

Education in the Gas Industry in 1928.

By F. W. GOODENOUGH, C.B.E.

The principal events of the year in connection with the Education Scheme of the Institution of Gas Engineers have been:

(1) The coming into full action of the District Committees established under the revised regulations adopted by the Institution in June, 1927; and

(2) The adoption by the Institution in its Charter of new rules governing the admission of members which directly associate the Education Scheme with the qualifications required from candidates for election.

The second event gives added importance to the first. Many a young man engaged in the production and distribution of gas, with the ambition to become some day a member—maybe the President—of the Institution of Gas Engineers will find the advice and assistance of the District Committees invaluable to him in deciding upon his course of studies and the place at which he can get tuition that will qualify him to sit for the appropriate examination. The District Committees have already proved their great value, and have shown the keenness that might have been expected in helping their junior colleagues. They will soon be asked to give the central Gas Education Committee information as to their experiences and as to any difficulties they have not been able to surmount in the matter of isolated students. A constantly increasing number of students are finding it possible to obtain the

tuition in ancillary subjects at recognized educational institutions which is required before they can be admitted as external candidates; and further progress in this direction is confidently looked for. The Central Committee has found the District Committees of great assistance, and there has been no disagreement of any moment whatever between them.

The well-known "green book" is being revised with a view to making it easier for intending students and candidates to decide what is the proper course for them to follow, and also to assist the District Committees in giving advice and decisions upon applications made to them for guidance.

There has not been so far as great an increase in the number of Gas Fitting students as had been hoped for since the Syllabus was amended to make the course essentially a craftsman's course for the improvement and certification of the technical skill of the operative gasfitter, rather than a scientific course for the education of the fitter who wants to qualify for promotion out of the craft. For the latter, the Minor Course in Gas Supply Practice provides the open door. The Committee hope that in the near future the whole industry will recognize and act upon this distinction in advising their would-be students as to the course best suited to their abilities and requirements. The importance of raising the standard of efficiency of the increasing number of fitters required for the artistic, as well as technically correct, installation of gas fires and other appliances, and for their subsequent proper maintenance, if the business of the gas industry is to progress as it might, and should, do, becomes more apparent every day, and a sound craftsman's course in Gas Fitting in all the principal centres of the country is one of the first essentials to such advance in the standard of performance.

On the selling side of the industry, except in so far as the Institution Scheme has been increasingly recognized as providing for the education of commercial representatives in the technics of their work—a very important and valuable exception—the only events during the year to be recorded are the increasing activity and usefulness of the Gas Salesmen's Circles (which are most valuable instruments for the education of all who attend them) and the establishment of the Government Committee on the question of Education for Salesmanship. The latter is only immediately of value as an indication of the growing importance attached to the selling side of industry. The public interest taken in the inauguration of the Committee's work is a sign very hopeful and encouraging to those who believe that in the raising of the standard of efficiency in commerce lies great promise of increased prosperity for the nation. All who believe this in general, and all who believe in particular that the future prosperity of the gas industry depends in no small measure on the growing development of its capacity for Selling and Service, will look anxiously and hopefully for a practical issue of the Committee's work.

Gas Stocks and Shares.

By F. J. BRADFIELD.

The past year has been a fairly placid one from the gas industry's point of view. It is true that gas administrators have had their troubles, as they always will have. Particularly have they been aggrieved at the continuous and very unnecessary support given to the electricity industry. Inquiries throughout the country, however, have elicited the fact that the publicity and the specious promises have had little effect on the steady progress of gas sales; and while there have been numerous cases of the loss of gas lighting to electricity, the increase in the uses of gas for other purposes has, in spite of the abnormal and prolonged mild weather, more than balanced such losses. With regard to gas securities, the year has been a most satisfactory one for investors; and with one or two minor exceptions, gas stocks and shares have all improved in value during the past twelve months.

It will be remembered that, during the year 1926, values—in consequence of the prolonged coal stoppage—depreciated to a great extent. During 1927, values recovered somewhat; and the past year, as stated above, has been one of general appreciation, all stocks coming into the market being speedily absorbed. This was also the case with new issues. The most important of these was the issue by the South Suburban Gas Company of £300,000 5 p.ct. ordinary stock, yielding, at the minimum price of £106 10s., £6 2s. 1d. p.ct., and for which over £700,000 was applied for at an average price of £107 9s. 9d. In addition, the Company issued a further £100,000 5 p.ct. perpetual debenture stock at a minimum price of £99.

The next in importance was the issue by the Bristol Gas Company of £250,000 5 p.ct. debenture stock at 96½, which was over-subscribed in half-an-hour. Among the remainder of the issues were the Hornsey Gas Company's £20,000 5 p.ct. preference stock at a minimum price of £85, and £40,000 3½ p.ct. ordinary stock at a minimum price of £80, and the Uxbridge, Maidenhead, and Wycombe Company's issue of £50,000 5 p.ct. perpetual debenture stock at a minimum of £94, which was also largely over-subscribed. There were also a number of issues of ordinary and/or debenture stocks by companies not quoted on the London Stock Exchange, including Harrogate £60,000, Canterbury £25,000, Grays and Tilbury £30,000, Slough £20,000, Gosport £25,000, Reading £28,910, Walton-on-Thames £12,000, Littlehampton £10,000, Rugby £17,750, Leyland £35,000, and Sheppey £10,000—most of which were over-subscribed.

During the year a new class of investor has appeared, trust companies having turned their attention to gas stocks as a steady and reliable investment; and one undertaking has at the present time fourteen or fifteen of such companies on its register. Companies naturally desire to raise new capital as cheaply as possible; and by far the greatest proportion of recent issues has been by way of loan capital. This policy is encouraged by the extended borrowing powers granted by Parliament. Prior to the war, companies were usually restricted to one-third of the paid-up capital, whereas at the present time it is the custom to grant powers up to one-half, and even 60 p.ct., of such capital. It is clear, therefore, that ordinary gas stocks are becoming proportionately scarcer; and with both the trust companies and the American investor buying large parcels of this very attractive investment, there is every probability of further improvements in values.

There is also the possibility that a Bill will be introduced into Parliament by the Government during the next session which, among other things, will, it is anticipated, extend the financial powers of companies and modify the existing restrictions with regard to issues of stock; and there is little doubt that the relief afforded thereby will have an important bearing on the values of gas companies' securities.

An unusual happening during the year was the adoption by the Gas Light and Coke Company and the Newcastle and Gateshead Company of the £1 unit for stock quotations. The Gas Light and Coke Company was the first gas company to make the change; and whereas the stock was previously quoted at an average of £95 10s. p.ct., the present average price is 18s. 4½d. per £1, or £90 17s. 6d. p.ct. Thus, in view of the general appreciation in prices, it is clear that the change has had no effect on the market value. In the case of the Newcastle Company, however, the average quotation prior to the change was £80 p.ct., and the present average quotation is 17s. per £1, or £85 p.ct.; but the slight improvement in the market value is not sufficient to attribute the rise to the smaller marketable unit.

Dealing with individual stocks, a typical instance of the fluctuations that have taken place during the past three years is that of the Commercial Company's ordinary stock. In January, 1926, the stock, then described as 4 p.ct. capital stock, stood at an average of 83½. The value dropped to 80½ in January, 1927, rose to 94 a year ago, and now stands at 99½. Another example is that of Liverpool ordinary, which was quoted at 83 in 1926, fell to 79½, rose to 89½, and now stands at 90½.

As already stated, there has been a general appreciation during the past twelve months. Lea Bridge 5 p.ct. ordinary heads the list of the English companies with a rise of 21 points from 96-99 to 116-121. Maidstone 5 p.ct. comes next with an increase of 17 points from 107-112 to

124-129; and the stock is still undervalued. Derby consolidated has gained 13½ points; Hornsey 3½ p.ct. consolidated has appreciated 13 points to 88-91; Croydon sliding-scale 12 to 110-113; Tottenham "A" has a rise of 11 points to 117-122; and North Middlesex 6 p.ct., Barnet 7 p.ct., Tottenham "B," Hastings 3½ p.ct., and Uxbridge 5 p.ct. also show substantial improvements.

Among the companies operating abroad, the £10 shares of the Hongkong and China Company are worthy of attention. In 1925 the shares stood at an average of 20, which was rather high, notwithstanding the fact that the dividend of 10 p.ct. was paid free of tax. Events in China, now fortunately becoming more settled, caused a rapid fall in the price, and transactions were recorded during 1927 at as low as 12⅜. The present quotation is 13-14, so that there is every prospect of capital appreciation. The sensational rise in the Continental Union ordinary stock, however, was the outstanding feature of the year. This Company, which is a "holding" Company and manufactures no gas, has distributed 1 p.ct. only for the past three years. Early in December the quotation was 37-40; but a sudden demand for the stock caused a rapid rise in the market quotation, which in a fortnight rose to 105-115, the highest transaction recorded being 110. On Friday, Dec. 14, the Directors issued a notice informing the stockholders that the Board were considering a reorganization of the Company which would be advantageous to the stockholders, and advising them not to dispose of their holdings. At the time of writing, no further information is available. The source of this advantage may be the revaluation of the Company's securities, but there are rumours of a much more extensive reorganization. Whether the present high price is justified is another matter; and it is undoubtedly a temptation to the existing stockholders to realize such a remarkable profit. The quotation is now 105-110. Imperial Continental capital stock also showed a wide variation in price during the past year. The quotation, which rose 14 points during the previous year (to an average of 144½), is now 200—an increase of a further 55½ points. It would appear that this stock has appreciated sympathetically with the rise in the Continental Union stock, as no announcement has been made to account for the increase.

Oriental ordinary has been in exceptional demand, and the present quotation of 112-115 indicates confidence in the management. With a dividend of 8 p.ct., which has been paid for many years and from which only 2s. in the £ is deducted for tax, the yield on the average quotation of 113½ is £7 os. 11d., which is quite attractive. No definite announcement has yet been made by the Primitiva Company with regard to the resumption of dividend payments. Considerable activity took place early in the year, and transactions were recorded at as high as 29s. 6d., which, for a £1 share on which no dividend has been paid for many years, is rather remarkable. Without doubt the market expects a distribution for the past year, but the most optimistic can scarcely anticipate this to be at a high rate. The present quotation of 25s. 6d.-27s 6d. is 7s. up on the year. Montevideo ordinary stock has made steady progress during the past three years, and is quoted at 95-97, or an increase of 5 points on the year. On a dividend of 6 p.ct. f.o.t., this is also an attractive investment.

As mentioned above, there have been few exceptions to the general rule of appreciation. Bombay £1 shares have receded 1s. 6d. to 20s.-22s., doubtless owing to the dividend reduction, and Cardiff consolidated and East Hull 5 p.ct. stocks are both quoted 3 points lower than a year ago.

Gas Affairs in Scotland.

By J. W. NAPIER, of Alloa.

While the interests of the gas industry are national, and its parent administration is directed from London, it is true beyond dispute that, along with geographical position, the characteristics of gas supply in Scotland are distinctly native. There is a strange difference in sensibility of outlook, of habit, of mode of domestic life, and industry is circled round one or two areas only. East and West are twain, but they do not meet. Glasgow and Lanarkshire, with a busy Clyde, divides itself from Edinburgh, the Lothians, and the Forth of picturesque value. Add the Kingdom of Fife, with its riches of coal, and speak of Dundee and Aberdeen, and much that is left is town and village, and roaming country of mountain and moor. The gas engineer is always Scottish, and he only goes South to distribute a little of his wit and caution, and to give and take of experience. "Sartor Resartus" is the text-book he carries in his knapsack, "Herr Teufelsdröckh" his secret hero, whom he companions with his Torch of Science, seeking for eminence and success in the business of light, heat, and power. Briefly, as gas administrators and managers, we love to think and act for ourselves.

PROGRESS.

It can be said that capital expenditure for new plant and works has continued during the past year. Glasgow and Edinburgh have been expending largely in replacements and additions to carbonizing plant. The installing of the vertical retort grows apace, and in addition to Edinburgh and Glasgow and the many other important provincial towns, many gas undertakings of comparatively small size have adopted the system. The vertical retort is now reaching down to the small works of twenty and thirty million size, and the number of such works adopting the system is increasing. The result, let it be said, is not solely because of the need of replacement, but in almost every instance to meet increased output.

Gas sales have increased at a slow but steady pace. Gas rates are lower, but with few exceptions they are not so low as might be hoped for, and as will be necessary if a leap and a bound in consumption of gas is to be realized. Glasgow is commendably recovering from its high price—the clear result of a perplexing and excessive surplus purchase of high-priced foreign coal during the strike year of 1926. Aberdeen occupies a unique position in municipal gas supply. From an examination of accounts for the last financial year, the capital debt has almost disappeared, and is now only £56,850 for a works with an annual output of 1670 million c.ft. Capital charges of interest and sinking fund are at the low figure of 2·11d. per 1000 c.ft. The average price of gas was only 2s. 2¼d. A block scale of charges applicable to gas used for all purposes has been established from 2s. 3d. to 1s. 8d. as follows:

			s.	d.
First	10,000 c.ft.	per quarter	2	3
Next	40,000	,, ,,	2	0
,,	50,000	,, ,,	1	10
,,	150,000	,, ,,	1	9
All over	250,000	,, ,,	1	8

Slot meters, a flat rate of 2s. 4½d. All discounts have been abolished.

GAS RATES.

It is recognized that, while tariff rates after American practice are correct in principle, and equitable as between of consumers of varying value, it is felt that Scotland will not readily accept the method. A quantity basis on a sliding-scale will obtain most favour; and it will not be surprising if, during the coming year, a large number of undertakings get ready for a complete change from the flat rates. In this regard, there is the growing belief that the time has almost arrived for the slot meter consumer to be treated on like terms with the ordinary meter users. Anyone who cares can work out the extra cost per 1000 c.ft.; and in view of the bulk proportionate number of slot consumers, and what are the real extra costs, he need not be surprised if the amount is so small as to appear unnecessary to exact, and, it may be said, unfair to impose. It is undoubtedly the feeling on this side of the border to include the little extra in the general rates for gas. A speaker of eminence at the recent York Conference on gas charges was heard to relate that the supply of free cookers with free fixing, also free fixing of gas appliances (sold outright), "was now recognized to be an essential mistake." This was strange talk to the Scottish mind; and those of us who know the position, and can speak with the experience of many years, do not give in to accepting any change. It is quite true that high-grade cookers, being more expensive, cannot be put on a free basis. The older types of cooker are being fitted with up-to-date burners, and in many towns the scheme of free cookers continues. Here, again, anyone who cares can work out the cost of free cookers with free maintenance—and this latter advantage to the consumer is important

—and he will be surprised how small the amount is per 1000 c.ft. The feeling again obtains to meet the cost in the general rates. This practice, whatever may be said against it, is acceptable to gas consumers in Scotland; and many gas authorities continue the policy. To attempt the general English practice of selling cookers outright, and to charge for fixing, would be fatal, and, indeed, would make our task impossible. We prefer to spread our expenses in the same indulgent manner as we spread our profits.

GAS AND ELECTRICITY.

It has been observed that electricity for street lighting is on the increase in burgh and county areas. Let it be said definitely that this is due to the " ideals " of councillors, and independent of expense—not because of saving in rates. The local authorities are similarly showing favour to electricity for lighting of dwellings under housing schemes. In this regard, there are a number of notable instances where a gas supply has been withheld from householders. The result has been to create feeling, and a demand that a gas supply be given. If electricity for lighting is inevitable in artisan and working-class houses, there is satisfaction in the evidence that gas consumption per consumer per annum still enjoys a high average. A recent analysis of a typical housing scheme having electric light showed an average annual consumption per gas consumer of 28,000 c.ft., with a price of about 4s. per 1000 c.ft. It is true that, with the price of gas ruling round about 5s. or 6s., the consumption is about half the amount stated. With the Government schemes being put slowly into practice, electricity will soon be available in the highways and byways, entering small towns and villages and scattered inhabited areas over a wide field. In distant towns and remote parts, the rate, it is expected, will be not less than 9d., and in some areas 1s., per unit. It is the case that in a number of towns with a 6d. rate for electricity, lighting of shops, public buildings, and houses of the better class have changed over from gas. But the fact can be recorded that, notwithstanding, gas sales have not gone back, even with a price of gas of about 6s. per 1000 c.ft. Indeed, there are several notable examples of towns of from only 3000 to 6000 of a population, where electricity has obtained a substantial hold, the gas undertakings of which have been obliged to spend capital on retorts and holders. Somehow it is the spirit and the feeling that gas, even in the small towns, will not suffer loss when time and progress have made adjustments—provided, of course, that gas managers are up and doing.

BYE-PRODUCTS.

The chapter of evidence relating to bye-products makes sad reading. In times past, it could always be counted that the price of coal fell in somewhat equal measure with coke. The slump in price of the two chief residuals, coke and tar, has given pause to reductions in the price of gas. In some cases it is known that deficits are likely to occur as the result of too big a reduction in price. The residual market exhibits no immediate prospect of betterment. Stocks of coke are, in general, abnormal; and little business is doing for shipment. The price for shipment has dropped to as low as 14s. to 15s. at the gas-works. Local prices for coke have suffered a reduction of from 5s. to 7s. per ton. There is considerable intrusion of supplies at cut prices into outside areas; and this competition is resented by the local undertakings. It will be granted, however, that the situation is unusual; and the provincial towns with large stocks find a somewhat easy way out by dumping in the cities. It is being discovered that coke from coke ovens is being offered and sold at prices far below the local rate. This source of competition is dangerous to local interests, and is outside the survey of the commercial section. The absence of demand from the Continent, where mild weather continues, is the key to the trouble of high stocks and low prices.

Ammonia, in the case of the small works, is now an expense instead of a profit. In a very large number of works distant from the distillers, the price of 7d. per 100 gallons of 4° Tw. liquor has to meet railway dues of from 3s. to 6s. per ton. In many instances the liquor is run to waste. The situation requires immediate action; and the view is strongly held that the day for the sale of liquor of 4° Tw. is past. Gas-works not making sulphate will be obliged to consider ways and means of producing concentrated liquor of not less than 10° Tw. Meantime, the report from the Committee of experts dealing with this problem is anxiously awaited.

Crude tar prices have dropped fully 10s. per 100 gallons in six months' time. The present outlook appears to be without hope of any early improvement. Gas-works with tar dehydration plant have found prices of road tar, creosote, and light oils almost halved. The demand for road tar during the past summer did not reach expectations. Supplies of bitumen mixtures from gas-works having tar plants are an increasing demand from road surveyors. Now that the Scottish Tar Board, as an instrument of help, is in being, assurance is felt that the demand for tar for roads will grow. At a recent meeting between Scottish surveyors and gas-works producers of tar, the surveyors expressed themselves in favour of tar—but with the one all-important qualification that the quality must be of good standard.

CO-OPERATIVE SCHEME FOR SALE OF TAR.

It is now permissible to state that a complete new arrangement for the sale of crude tar and the marketing of its products is under negotiation between the Management Committee for Scotland of the National Gas Council and the Tar Distillers. Only a bare outline can at present be given of the proposals. In the first place, it is now stated (for the information of gas undertakings in the membership of the existing tar scheme) that the new co-operative scheme is intended to take its place. The existing scheme terminates its second five years' period in May, 1929. Should the co-operative scheme be accepted, the existing scheme will not be renewed. The principle of the new scheme is that of a co-partnership between gas-works and distillers. Financial interest will be mutual, and the gas undertaking and the distiller will pool the profits accruing from the manufacture and sale of products at market values. The profits of the two parties will be proportionate on a basis yet to be established. A Committee of Control and Management will be appointed, composed of representatives of gas undertakings and distillers; the gas interests being given the majority. Shortly stated, the commercial value of the raw tar leaving the gas-works, and the finished products leaving the distillers' works, will belong to the gas undertaking and the distillers as one body. The gas undertakings will have a voice, along with the distillers, in the practical working-up of the tar and the marketing of products. A number of similar co-operative schemes have been in operation in England for a number of years past, with, it is understood, marked satisfaction and success. This fact alone should go a long way towards the acceptance of a co-operative scheme by Scotland.

LOW-TEMPERATURE CARBONIZATION.

Except for the McLaurin process in operation at one of the Glasgow Gas-Works, no new installation has been started to work. A small installation of the " Fusion " retort, to work up cannel coal and to produce pulverized fuel for boilers for electricity generation on the site, was completed at Burghlee Pit, Loanhead, fully a year ago. It has not yet started to operate. A promising installation on a big scale is in process of erection at Glenboig. The plant will work the Bussey process. A recent inspection of the plant revealed a most complete arrangement of handling of coal and coke, treatment of products, electricity generating plant, and Diesel oil engines to be driven by oil from the plant. The retorts are capable of a throughput of 600 tons of coal per day. When in operation, the plant will put on the market about 300 tons of coke daily, and will sell to neighbouring industrial works about 15 million c.ft. of gas per 24 hours. The complete plant, it is anticipated, will be started to work in May of this year.

LEGISLATION.

Scotland is happy in its gas supply inasmuch as the set of present-day circumstances continue a long-enjoyed freedom from Parliamentary control except of the most gentle character. There does not exist even the slightest complaint, and there is no barbed wire fence to the liberty and free-will of the individual undertaking, either company or municipal. There is exception to this, of course, in the

cases of the four statutory Company undertakings—viz., Stirling, Coatbridge, Musselburgh, and Busby. They are the only undertakings at all interested in the new Bill proposed by the National Gas Council. The private gas-works are non-statutory, and these, together with municipal works under the Burghs Gas Supply (Scotland) Act, 1876, form 90 p.ct. of the total, and are free from limiting restrictions of any kind. A municipal works under this Act can borrow money as and when desired, and to whatever amount. There are no maximum price requirements; and at its own freewill the concern can take its supply of gas far beyond its boundaries. It may not supply gas in an area already being supplied by another concern, but it can give to any such concern a bulk supply, and may even purchase the business. And because of all this freedom, amalgamation of gas-works has taken place, by mutual consent. The case of Dunfermline under municipal control is interesting. It has roamed at will over a large district outside the burgh, taking in many villages where no gas supply formerly existed, and giving a bulk supply in two instances. The voice of Scotland is therefore silent as regards new legislation, and peace and contentment prevail. If there is one matter to which criticism can be directed, it is that the Gas Regulation Act requiring the adoption of the therm method of charges has not been made compulsory to all statutory undertakings coming under the Act.

Education Scheme.

Because of conditions and circumstances which materially differ, we have not whole-heartedly accepted the Institution Scheme. It will not be a complete success unless provision is made for the particular individual who under present rules is made the victim of isolation, and is prevented from attending classes at a recognized school. We will not accept conditions which curb the ambitions of the individual. Scotland is very proud of the intuitive character of her sons. Scotland demands devolution from the rule and order of the Institution Scheme. The Scheme will fail in result for a crowd of our young men unless they are allowed self study as individuals, free from class instruction where such is not possible. The standard of ability of the student need not suffer because of this. One is reminded that character and stamina, and the power of the individuals, are the real higher qualifications, and are the factors which command success. We want strength of character first, and reasonable freedom for the student as an individual to fit himself for examination. The Scheme in Scotland has received almost unanimous support from gas undertakings. About 150 undertakings contribute an annual sum of fully £300, and suitable grants have been made to the Technical Colleges at Edinburgh, Glasgow, and Dundee.

In Conclusion.

The gas industry in Scotland continues to grow in strength. The personnel of the profession is more powerful and attractive. The public have attained a higher and surer appreciation of gas and its values, especially for domestic use. Gas distribution and gas sales are advancing on a higher plane of efficiency. The policy of the industry is becoming more and more constructive. It is better attuned to higher ideals, and the standard and honour of gas as one of the essential utilities was never higher in public and Press opinion than it is at the present time. The activities of to-day looked at alongside pre-war duties is to think of peaceful modesty compared with strenuous many-sided interests. Technical Associations, Senior and Junior, are robust and creative, Commercial Sections, the National Gas Council, the Federation of Gas Employers, the Scottish Tar Board—all these institutions form the parliament of our administration and management.

Gas Affairs in Ireland.

By W. J. Grey, A.C.A.

The record of the gas industry in Ireland during the past year may be described as one of substantial progress. Not alone have more gas and more residual products been sold, and considerably more consumers secured, but the sale of additional gas apparatus has exceeded the most sanguine expectations. The aggregate production has increased by about 10 p.ct.; and while, to some extent, this is accounted for by an increase of seven thousand in the number of consumers, yet it is gratifying to realize that it is chiefly due to an increase per annum of nearly 2000 c.ft. in consumption per consumer.

The increased popularity of gas fires and water heaters undoubtedly accounts for some of it, for nowadays the use of gas cookers (as necessities rather than luxuries) may be taken for granted; but, on the whole, it is probably the result of the increasing realization of the advantages accruing from the greater use of gas. Skilful advertising, too, has been a useful means of attracting new consumers, for the curiosity fostered by the advertisements leads to inquiry; inquiry to test; and test, as is proved by the records, to the permanent adoption of the particular gas appliance meeting the consumer's needs.

The various gas undertakings in Ireland have shared, practically without exception, in this march of prosperity. In certain cases, the price charged for gas had to be raised, but, against this, many of the larger undertakings, such as Cork, Limerick, and notably Dublin, have been able to reduce their charges. In Dublin, the reduction has been substantial (equivalent to nearly 10 p.ct.), and, seeing that the gas produced in Dublin alone exceeds that for the rest of the country, excluding Belfast, it can be safely claimed that, on the whole, there has been a general reduction in price.

Extent of the Industry in Ireland.

Perhaps some idea of the extent of the gas industry in Ireland may be obtained by consideration of the fact that the coal imports reach the figure of 425,000 tons per annum. Of this, about 54 p.ct. is taken by the six counties comprising Northern Ireland; but, if Belfast and Dublin are eliminated (as these cities, between them, take two-thirds of the total), it is found that the remainder of the Irish Free State takes (say) 80,000 tons, as against the remainder of Northern Ireland which takes 65,000 tons. As there are sixty gas-works in the Free State, compared with thirty in Northern Ireland, it will be obvious that the average output per works is larger in the latter; but (still eliminating Belfast and Dublin) the average consumption per consumer in the Free State is greater, and discloses more marked progress during the year. In illustration of the latter, perhaps no better case than that of Dublin could be taken, for the sales of gas in that city have been increased by more than 60 p.ct. during the last decade, and actually by 25 p.ct. in the last two years.

Moreover, the progress of the gas industry in Ireland is by no means confined to consumption, or increased numbers of consumers, but is also attributable to the modern methods in gas practice adopted by the larger undertakings. Great improvements have been effected at Dublin, Cork, Wexford, Limerick, and many other works. Limerick Corporation is at present faced with a claim for compensation by gasworkers unemployed through the introduction of vertical retorts; while Dublin has not only completed the erection of a splendid installation of vertical retorts, but has during the past year completely modernized the original portion of the installation erected more than seven years ago.

Electrical Competition.

Present progress, then, is undeniable. What of the future? In Northern Ireland an electricity scheme is pending, while in the Free State the Shannon Electricity Works is approaching completion. Ireland is, however, in the main an agricultural country; and the Irish farmer (whom the Shannon Scheme principally aims at benefiting) is perhaps the most conservative person of a notoriously conservative people, whose conservatism has broken the heart of many a well-meaning would-be reformer. Even in Dublin City, where there is an efficient municipally-owned electricity undertaking, doing everything possible to attract consumers, Irish conservatism—fostered, of course, by expert service and organization—has helped the Gas Company in recent years to achieve the greatest prosperity yet recorded in its history. An instance of this is a certain large housing scheme where the houses, numbering several hundreds, were cabled and wired for cooking, heating, and lighting by electricity only. Immediately the tenants came into occupation, however, the

demand for gas arose; and now almost every house has gas for cooking, and many of them have also gas installed for heating, water-boiling, and lighting.

The other large gas undertakings throughout the Irish Free State are in more or less the same position; and thus the Shannon Scheme will bring them but little more than a continuation of the competition which they are at present meeting so successfully. Even the small gas-works should more than hold their own against cheap electricity.

Turning now to the question of the relative importance of the gas and the electricity industries in Ireland, a few comparisons, secured by utilizing the factor of 29·28 units of electricity as equal on a heat unit basis to one therm of gas, may prove interesting. First, the Dublin Gas Company's increased business for 1927 over 1926 (which, of course, was smaller than usual on account of the coal strike in the latter year) was greater than the total output of the Dublin Corporation Electricity Undertaking. Secondly, and even more significant, the Dublin Gas Company's annual output is five times the total electrical energy now generated in the Irish Free State—or two-and-a-half times the total annual output which the electricity experts hope may be generated when the Shannon Scheme is in operation.

Gas Regulation Amendment Bill.

Another event of interest and importance to the gas industry in the Free State, during the present year, has been the recent passage into law of the Gas Regulation Amendment Bill, the main provisions of which were concerned with the stamping and verification of meters. It would almost seem, from the debates, that one of its principal objects was to extend to certain small undertakings on whom such obligation did not already rest the obligation of using none but officially stamped meters. The Bill provides that no gas meter may continue to be used for more than ten years after the date of stamping, without reverification. This is an added burden on gas undertakings in the Free State, because, of course, it is well-known that meters made by makers of repute can give efficient service, if properly used, for a much longer period than ten years. There is also a provision ultimately to discontinue recognition of the Board of Trade stamp; and indeed it was originally proposed that a maximum period of one year should be allowed to gas undertakings to bring in such meters for re-stamping. A very large number of meters would naturally have been affected by such proposal—in Dublin alone, nearly 27,000—but fortunately it was eventually conceded that the period of grace should be extended to five years; and this eases the situation considerably. This legislation does not, of course, apply to Northern Ireland, where the conditions as regards verification of meters remain unchanged.

The Future.

Without the gift of prophecy, one can make no accurate forecast of the future position of the gas industry in Ireland, but one can, and should, deduce, from the inspiriting and undoubted facts of its past and present development, that its progress will be steady and far-reaching. There may be competition in plenty, but the gas industry, far from fearing that, is ready and willing to meet it. If honourable conflict happens to disclose unsuspected weak spots in one's own armour, these vulnerable places can be efficiently and speedily strengthened, and the fight carried on with the confident realization of the industry's vast resources. Gas undertakings are not philanthropic institutions—nor do they look for philanthropy on the part of their supporters. They simply give value for money. The article they manufacture is proved, by use, to be a necessity and not a luxury; and therefore there would seem to be every prospect of the maintenance, by the gas industry, of the high place it has deservedly won, in the eyes of the Irish people, as an indispensable public utility service.

The Holborn Explosions.

The Commissioners appointed by the Home Secretary to inquire into the circumstances of the recent explosions in the neighbourhood of New Oxford Street [see p. 844 of last week's issue of the "JOURNAL"] have, as will be gathered from the report of their proceedings which appears on later pages of this number, lost no time in getting to work upon their task. In view of the damage caused by the explosions, the Gas Light and Coke Company did excellently in resuming, practically 48 hours after the occurrence, supplies of gas to all their consumers in the district who had been temporarily deprived of it.

The Position of Mains.

Arising out of the accident, a suggestion was advanced in "The Times" by Sir Bruce Bruce-Porter that all heavy vehicles using the streets of cities and towns should be shod with pneumatic tyres. Lord Montagu of Beaulieu, after expressing agreement with this, adds: "But surely it is also imperative that public services, such as supplies of water, gas, electricity, telephones, &c., should no longer be buried under our roads. The construction of a modern highway involves skilled and expensive engineering; and roads are ruined if strips of their foundations and surfaces are destroyed continually by being dug-up for subsurface purposes. All essential public services should be conveyed elsewhere than under roads—either underground in ample subways, or where possible, especially in the country, by the side of highways."

Ventilated Tunnels.

Another correspondent of "The Times" recognizes the importance of ventilation in connection with subways, &c. He is Mr. H. Lewin Robinson, and he says: "Would it not be as well for all new mains to be laid in ventilated tubes or tunnels? I refer not merely to coal gas mains, but to electric also, because direct current electricity in the presence of water can give rise to a terribly explosive mixture of tasteless and odourless gases—hydrogen and oxygen—that can do far more initial damage than a mixture of coal gas and air, and so break the gas mains and cause further explosions and fires."

Quarter Day Terrors.

Referring back to the leading article upon the subject of "Quarterly Demands," which appeared in our pages a few weeks ago [see "JOURNAL" for Nov. 14, 1928, p. 454], we are gratified to see our views are those of the writer of the "Londoner's Diary" in the "Evening Standard," who makes allusion in the following terms to what he describes as "Quarter Day Terrors": "This is a time when most of us like to push our troubles into the background; but Colonel Sir Arthur Holbrook, M.P., has chosen to remind us of the lurking spectre of the coming quarter day, so difficult to cope with after our feastings and generosities. Sir Arthur would have quarter days abolished as anachronisms; and there is a great deal to be said for his scheme now that so many households are run on the basis of a monthly salary. One of the London Gas Companies has begun to send monthly instead of quarterly accounts; and if the custom were followed by all services and tradespeople, the average householder's financial problems would be much simpler than they are now. The quarter-day habit is based on an assumption that we all live on rents or dividends."

America's Huge Waterless Holder.

The first issue of the "JOURNAL" published in 1929 presents its readers with articles which are as interesting as it is confidently felt they will prove useful. One of them is a description drawn from an American contemporary which will put engineers on this side of the Atlantic in possession of valuable information as to what is being done by their professional brethren in the United States in the matter of waterless gasholder construction. There has just been inaugurated at Chicago a holder of this type which has a capacity of no less than 20 million c.ft. The structure, which is, as will be noted, in many respects remarkable, is 416 ft. high, exclusive of a 70-ft. tower, and has an over-all diameter of 283 ft. It is located two miles south-east of the Chicago Municipal Airport; and the People's Gas Light and Coke Company co-operated with aviation authorities in the Department of Commerce at Washington, and with local air transport interests, in painting, lighting, and otherwise marking the holder.

PERSONAL.

In the current issue of the "Co-Partnership Journal" of the South Metropolitan Gas Company, there is an appreciation by Dr. Charles Carpenter, the President of the Company, of Mr. W. T. LAYTON, who has retired from the Editorship after twenty years' service in that capacity. "It can be truthfully said," writes Dr. Carpenter, "that the last number issued under his editorship has maintained the standard set by the first—no light task when the scope of our activities is considered. Wisely he never attempted to compete with contemporary journalism, comic, social, or technical. But with a just appreciation of all three phases of our news hunger he provided as much of the spirit of each as is appropriate to a house journal. For that House and in its history he had unchanging faith and admiration. The story of our Company and all it stands for is to be found recorded in the periodical he edited with such scrupulous attention to truth and such deep-rooted faith in co-partnership. He was more than an historian of the gas industry; he was a chronicler of its times. In his "Early Years of the South Metropolitan Gas Company" he brought together a mine of information about our Company which is not only a faithful story of its progress, but a record of achievement which should furnish inspiration to all in its service, present and future. Mr. Layton has lived not only for, but in, his work; and therein lies the secret of his success. By his retirement from the editorial chair of the 'Co-Partnership Journal,' one more tried and faithful servant of the Company and its co-partnership has laid down his burden. I shall miss his help." We too shall miss the association of one who, in addition to his literary ability, has always manifested that comradeship which is so highly appreciated between journalists.

Mr. LESLIE B. CHAPMAN, B.Sc. (Eng.), who for some time has been on the staff of the Engineering Department of the Newcastle-upon-Tyne and Gateshead Gas Company, has been appointed Assistant Engineer and Manager to the Tipton Urban District Council Gas Department.

On Monday, Dec. 24, at the Langley Mill Gas-Works, Mr. HAROLD J. ANDREWS, Managing Director of the Langley Mill and Heanor Gas Light and Coke Company, was presented with a gold watch as a mark of esteem from the employees of the Company. In accepting the watch, Mr. Andrews said that it had always been his aim to try to promote a good feeling between management and staff; and it was highly gratifying to have such a proof of the success of his efforts.

The vacancy which was recently caused in the Bournemouth Gas and Water Company Board of Directors by the death of Sir Charles Jessel has been filled by the appointment of Mr. JAMES JOHN WITHERS, C.B.E., M.P. Mr. Withers was born in 1863, and was educated at Eton and King's College, Cambridge. He afterwards entered the legal profession, and is now Senior Partner in the firm of Withers, Bensons, Currie, Williams, & Co. He has represented the University of Cambridge in Parliament in the Unionist interest since 1926.

Mr. J. H. BOOTH, formerly of Oswaldtwistle, and for three years Works Manager of the Spennymoor and Tudhoe Gas-Works, Durham, has been appointed Gas Engineer and Manager to the Winsford District Council. He received a presentation of a gold watch from his colleagues at Spennymoor.

OBITUARY.

The death has taken place of Mr. PENN DENNIS, of Barmouth, one of the Partners of the Barmouth Gas Company, Ltd. He was 64 years of age, and was well known and much respected in the town.

Mr. JOHN OSWELL BURY, of Wrexham, has died, after a brief illness, at the age of 81. He was Chairman of the Wrexham Gas Company, and a Justice of the Peace for the borough and the county. He was a prominent Freemason.

ON THE ELECTRICAL SIDE.

A Vexed Question.

We seem to remember having seen it suggested in the electrical Press that "gas interests" are responsible for the undoubted agitation that exists against the bespattering of the country with poles and overhead transmission lines. If that be so—though we have never learned what grounds there are for the assertion—the "gas interests" would appear to have been particularly busy at Rothbury, a pretty Northumbrian village, the residents of which (who may or may not feel flattered if they are dubbed the "gas interests") manifest a natural objection to the spoiling of the beauty of the place. This desecration may prove necessary in the cause of progress; but those who live at Rothbury see no reason why they should do anything to encourage it. A decision to boycott the current of the Newcastle-on-Tyne Electric Supply Company was reached at one public meeting of the residents, confirmed at another, and reaffirmed at a third, when it was resolved "to use no electric current for private or public purposes unless the supply is conveyed underground." According to Lord Armstrong, who presided, there is yet another objection to the erection of the poles—*i.e.*, danger arising from motor-cars running into them. He explained that 257 householders had pledged themselves not to use electric lighting unless the wires were carried underground. For their part, the Electric Supply Company had offered to put the wires underground in certain places, provided the boycott were removed. This was considered to be a fair compromise by the authorities, who agreed to recommend it for consideration at a further public meeting. A meeting was duly held, when the compromise was unanimously rejected, and the Rothbury Council came in for a considerable amount of censure. The Electric Supply Company replied by withdrawing the concession. Subsequently it was understood that the Ministry of Transport had sanctioned the erection of the poles.

Division of Costs.

The third public meeting of Rothbury residents was attended by Mr. R. P. Sloan, Chairman and Managing Director of the Newcastle Electricity Supply Company, who reminded those present that if a supply of electricity was to be made available in the villages, it was necessary that the capital expenditure should be kept within reasonable limits. The division of costs, he said, worked out as follows: Power station, 10 p.ct.; transmission and distribution, 40 p.ct.; and capital charges, interest, &c., 50 p.ct. This showed how important it was that capital costs should be kept down. Presumably this division of costs relates to village supplies of electricity, and will not be of general application. Mr. Sloan made it clear that, whatever may be the attitude of Rothbury, the Company will not regard themselves as absolved from fulfilling their statutory obligations. He added that the village is but one of a hundred or more to be supplied by the Company, and if, as the result of agitation, they had to lay underground cables in one village, they would have to do it in all where agitation was started. The cost in the aggregate would be increased 150 p.ct. The situation is an interesting one, inasmuch as while the Company undoubtedly have the power to force their wires and poles upon the community, they have, with equal certainty, not the power to compel the community to take their current. These being the circumstances, one speaker at the meeting seemed surprised that the Company "had adopted an arbitrary and autocratic manner."

Victoria Embankment Lighting.

The Highways Committee of the London County Council have been considering what should be done to bring up the artificial lighting on the Victoria Embankment to the standard necessary for present-day traffic. The existing installation was designed for series working with arc lamps, the energy for which was generated in the Council's own works at Hungerford House, with dynamos driven by gas engines. This generating station, however, was closed in 1910; and since then current has been purchased from the public supply authorities. Upon the advent of gas-filled incandescent electric lamps, these were substituted for the arc lamps; and the lighting is now furnished from 63 kerb, 69 parapet, and 38 refuge standards. There are also a triple standard in the Northumberland Avenue approach, and six gas-lit standards on refuges. The cables (part of which are in the Victoria Embankment subway, and part under the footway) were laid in 1900, and will be unsuitable for the improvement which is to be carried out. The intention is to accept an offer by the Charing Cross Electricity Supply Company, Ltd., providing for centrally-suspended lanterns over the carriageway at intervals of 140 ft., and at a height of 30 ft., each suspension carrying two 1500-watt gas-filled lamps in suitable fittings; and also for the necessary new cables to be laid under the footway. In addition to the main carriageway lighting, the scheme provides for lighting the triple standard and two kerb standards in Northumberland Avenue approach, and the refuge and parapet lamps. The Committee feel certain that central lighting will be the best method of obtaining reasonably uniform and efficient illumination of the carriageway, and that the necessity for putting the lighting into a satisfactory condition justifies any small interference with the amenities of the Embankment that would be caused by the overhead span wires, which, however, at a height of 30 ft., would be inconspicuous.

THE "GAS JOURNAL" CALENDAR AND DIRECTORY FOR 1929.*

The new Calendar, the distribution of which is now complete—a free copy to each subscriber to the "JOURNAL"—contains several important new features, of which the following is a brief account.

Under the heading, "Carbonization," p. 79, is a list of the principal low-temperature carbonization processes now at work, with a brief description of each. A list of "Gaseous Fuels," with their composition, specific gravity, calorific value, &c., is to be found on p. 96.

The main portion of the text consists, as usual, of "Gas Undertakings," with their declared calorific value, price of gas, annual production of gas in cubic feet and therms, &c. A new page (141) is devoted to "Grading;" the different kinds of sieves being described. A "List of the Engineers and Superintendents Responsible for Public Lighting in the United Kingdom" will no doubt be regarded as a welcome addition.

"Recent Developments and Papers" for the year 1928 are summarized on pp. 160-63, while in "Recent Researches—Reviews," immediately following, notes are submitted regarding the more important advances and researches recorded in the "JOURNAL" during the year 1928. Here also is to be found an interesting list of the various declared calorific values employed by different gas undertakings; this being compared with a corresponding list for the year 1927. We learn therefrom of a growing partiality for a standard of 500.

Attention is drawn, among other things, to the importance of the determination of the fusion-point of coal ash (p. 167). "Water Softening" (p. 177) finally forms a new short, closing chapter.

* Written and compiled by Dr. W. B. DAVIDSON. Published by Walter King, Ltd.; price 7s. 6d., post free.

Corrigendum, "Gas Journal" Calendar and Directory, 1929.—We regret that in the latest issue of our Directory the figures for the Sudbury Gas and Coke Company, Ltd. (Suffolk), are misplaced so as to relate to the Sudbury Gas Company (Derby); and the figures for the former Company still relate to an earlier year.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

Jan. 5.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.—Meeting at Newport. Paper by Mr. Kelvin Jones, on "Coal Tar."

Jan. 5.—WESTERN JUNIOR GAS ASSOCIATION.—Meeting. Paper by Mr. W. Rogers, on the "Tankless Holder."

Jan. 5.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Visit to the works of the Tottenham District Light, Heat, and Power Company.

Jan. 9.—MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.—Visit to Messrs. Sawer & Purves. Paper by Mr. T. Davis, on "Distribution with relation to the Selling Price of Gas."

Jan. 12.—SCOTTISH JUNIOR GAS ASSOCIATION (EASTERN DISTRICT).—Joint Meeting with Western District at Glasgow. Paper by Mr. C. Chapman, Provan Chemical Works, Glasgow, on "Tar."

Jan. 16.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting.

Jan. 17.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council meeting in the afternoon.

Jan. 19.—YORKSHIRE JUNIOR GAS ASSOCIATION.—Meeting in Halifax. Paper by Mr. J. W. Denton, on "High-Pressure Governors and Plant." Inspection of the Halifax Gas-Works.

Jan. 21.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Dinner and dance at the Grand Hotel, Birmingham.

Jan. 25.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Meeting at the Westminster Technical Institute. Paper by Mr. C. A. Masterman, on "The Thermal Insulation of Gas Consuming Apparatus."

Jan. 26.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Visit to Messrs. Peebles & Co., Ltd., Tay Works, Bonnington, Edinburgh.

INSTITUTION OF GAS ENGINEERS.

Jan. 8.—Gas Education Committee, 4 p.m.

Jan. 9.—Executive Committee, 10.30 a.m.; Finance Committee, 11.30 a.m.; General Research Committee, 2.30 p.m.

GAS STOCK AND SHARE MARKET.

[For Stock and Share List, see later pages.]

As was to be expected, conditions on the Stock Exchange last week were very subdued. The anxiety with regard to the King's health continued in spite of the more hopeful bulletins; and, with the Account in sight, there was little inclination to increase commitments. A cheerful optimism prevailed, however, and the feature of the week was the marked strength of the gilt-edged market, especially British Government securities. The approach of the dividend season attracted more buyers to the Home Rail market; and this was accentuated by the satisfactory traffic returns.

In the Industrial section, the only real activity was in the new Ford shares. The experience in connection with these shares is probably unique for a new flotation. After reaching a figure of 4$\frac{1}{16}$ premium, American selling brought the price down to 2$\frac{3}{4}$ premium; and it is extremely doubtful whether this figure will be maintained. It is well known that during the past year there has been an enormous amount of speculation in Industrial shares, and in some cases fortunes have been made. There is, however, the other side of the picture. Investors who have been left with the shares at high prices are not in such a happy position, and considerable anxiety exists with regard to the future of the more speculative shares.

It rarely happens that gas stocks show any appreciable rise in price, but holders of such stocks have the satisfaction of possessing reliable investments, with steady and possibly rising dividends. The boom in Continental Union ordinary is none the less welcome, and the interested parties would be glad to have some definite announcement of the reorganization proposals. It will be noticed that the price eased off slightly last week. Nothing is definitely known of the reason for the activity in the Imperial Continental capital stock, which was still in demand at the end of the week. Primitiva ordinary moved upwards again, and business was done during the week at 26s. 10$\frac{1}{2}$d.

It will be seen from the table that, following the practice of previous years, the lowest and highest transactions recorded during the year are substituted for those of the past week. The most extreme variation is, of course, the Continental Union stock with 82 points, from 28 to 110, which is the more remarkable as it has occurred mainly during the past four weeks. Imperial Continental comes next with 58 points, from 145 to 203. Of the English companies, Lea Bridge 5 p.ct. shows a variation of 24 points, from 96$\frac{1}{2}$ to 120$\frac{1}{2}$, and Maidstone 19 points, from 109 to 128. Apart from the steady appreciation in values during the year there is little to record, but gas investors have reason to be satisfied with their investments.

The following transactions were recorded during the week:

On Monday, Commercial 3 p.ct. deb. 57$\frac{3}{4}$, Continental Union 107, 107$\frac{1}{2}$, 108, 109$\frac{1}{2}$, 3$\frac{1}{2}$ p.ct. max. 64$\frac{1}{2}$, Imperial Continental 200, 200$\frac{1}{2}$, 200$\frac{1}{4}$, 200$\frac{3}{4}$, 201, 203. Metropolitan (of Melbourne) 5$\frac{1}{2}$ p.ct. deb. 101$\frac{1}{4}$, Primitiva 26s. 3d., 26s. 7$\frac{1}{2}$d., 26s. 9d., 26s. 10$\frac{1}{2}$d., South Metropolitan 107, 107$\frac{3}{4}$, Wandsworth, Epsom 5 p.ct. 119. Supplementary prices, Gas Light and Coke 5 p.ct. deb. 1952-57 100$\frac{3}{4}$.

On Thursday, Continental Union 107, 107$\frac{1}{4}$, 108, Gas Light and Coke 18s. 4$\frac{1}{2}$d., 18s. 6d., 18s. 7$\frac{1}{2}$d., 18s. 10$\frac{1}{2}$d., 4 p.ct. pref. 80, Imperial Continental 200, 201, 202, Primitiva 26s. 4$\frac{1}{2}$d., 26s. 6d., 26s. 7$\frac{1}{2}$d., 26s. 9d., South Metropolitan 107. Supplementary prices, Gas Light and Coke 5 p.ct. deb. 99$\frac{1}{4}$, 100$\frac{3}{4}$.

On Friday, Continental Union 107, 107$\frac{1}{4}$, 107$\frac{1}{2}$, Croydon sliding-scale 112$\frac{1}{2}$, European 9$\frac{1}{2}$, Gas Light and Coke 18s. 3d., 18s. 4$\frac{1}{2}$d., 18s. 6d., 18s. 9d., 4 p.ct. pref. 79$\frac{3}{4}$, 3 p.ct. deb. 59, Imperial Continental 198, 199, 200, 201, Maidstone 5 p.ct. 127$\frac{1}{2}$, 128, Metropolitan (of Melbourne) 5$\frac{1}{2}$ p.ct. deb. 101, 101$\frac{1}{4}$, Primitiva 26s. 3d., 26s. 4$\frac{1}{2}$d., 26s. 6d., 26s. 7$\frac{1}{2}$d., 26s. 9d., 26s. 10$\frac{1}{2}$d., South Metropolitan 107, 107$\frac{1}{4}$, 3 p.ct. deb. 61, Wandsworth, Epsom Stock 119$\frac{1}{2}$, 4 p.ct. deb. 78. Supplementary prices, British, Hull 3$\frac{1}{2}$ p.ct. deb. 65, 4 p.ct. deb. 76, Gas Light and Coke 5 p.ct. deb. 100$\frac{3}{4}$.

Preparation for close of the year requirements was the dominant feature in Lombard Street.

The changes in the currencies were small. Sterling on New York was slightly down on the day at 4.85$\frac{5}{8}$; French francs finally quoted at 124.02$\frac{1}{2}$; Belgas at 34.87$\frac{1}{2}$; Italian lire at 92.73$\frac{1}{2}$; and pesetas at 29.77 were all in favour of London. German reichsmarks at 20.38$\frac{1}{2}$ and Dutch florins at 12.07$\frac{1}{2}$ were a little dearer.

Gold was unchanged at 84s. 11$\frac{1}{2}$d. per oz.; and, with no business doing, Silver was quoted at 26$\frac{7}{16}$d. per oz.

The Bank Rate is 4$\frac{1}{2}$ p.ct., to which it was reduced from 5 p.ct. on April 21, 1927. The Banks' deposit rate is 2$\frac{1}{2}$ p.ct., and the deposit rates of the discount houses are 2$\frac{1}{2}$ p.ct. at call and 2$\frac{3}{4}$ p.ct. at notice.

GAS BILLS FOR 1929.

We begin to-day our review of the small number of Bills containing clauses having reference to gas undertakings, notices of intention to promote which have already been reported in our pages.

ALDERSHOT.

The Aldershot Gas, Water, and District Lighting Company are desirous of extending their limits of supply, as well as of changing their name, &c. The Bill provides that the limits within which the Company may supply gas shall extend to, and include, in addition to the existing gas limits, a portion of the Parishes of Compton and Godalming Rural. The powers and obligations of the Godalming Gas and Coke Company, Ltd., with reference to the supply of gas within the added limits, shall cease. The name of the Company is to be the Southern Power Company.

SALE OF STOCK.

A sub-section relating to the sale of stock reads:

> Any ordinary stock or preference stock to be issued, whether the same be at a premium or not, may (with the approval of the Board of Trade, to be signified in writing under the hand of an Assistant Secretary of that Board), if the Company think fit, be offered to all the consumers supplied by, and persons in the employ of, the Company, at a price which shall be as near as may be the average market price of such ordinary stock or preference stock in the period of two weeks immediately preceding such offer (provided that in no case shall the price at which such ordinary stock or preference stock shall be offered be lower than 5 p.ct. below such market price). To ascertain the average market price of the ordinary stock or preference stock for the purposes of this sub-section, the mean daily prices recorded in the London Stock Exchange daily official list shall be taken for the said period of two weeks.
>
> Any ordinary stock or preference stock which has not been so offered as aforesaid, or which has been so offered and not taken up, shall, before being offered to the holders of any ordinary stock or preference stock of the Company, be offered for sale by public auction or tender in such manner, at such times, and subject to such conditions of sale as the Directors shall from time to time determine.

AGREEMENTS BETWEEN COMPANY AND OTHER GAS UNDERTAKERS.

There is a clause relating to agreements between the Aldershot Company and other gas undertakers which reads as follows:

> The Company and any local authority, company, body, or person authorized to supply gas in any limits of supply adjoining, or near to, the gas limits may, with the approval of the Board of Trade, enter into and carry out agreements or arrangements for the acquisition or lease, management, or operation by the Company of all or any part of the undertaking of, or the exercise by the Company of any rights and powers of the adjoining undertakers, or for the use by any such adjoining undertakers of any conveniences or services afforded by the Company in relation to the manufacture and supply of gas or necessary or convenient for the operations of the adjoining undertakers as gas undertakers.
>
> Except in so far as is provided by this section, the Company and any adjoining undertakers entering into any such agreement or arrangement shall remain, and be subject to the same obligations and liabilities to all persons not being parties to any such agreement or arrangement as those to which they would have been subject if such agreement or arrangement had not been entered into.

The Company are also desirous of securing power to acquire by agreement, but not otherwise, from any local authority or other undertakers to whom a Provisional, Special, or other Order under the Electricity Acts shall have been, or may be, granted, relating to a district or place adjoining or near to the electricity area or any area in which the Company may be giving a supply of electricity, the undertaking authorized by such Order. The powers to be conferred by this section may be exercised in respect of part only of any such undertaking. The Company and any local authority or other undertakers authorized to supply electricity in any area adjoining or near to the electricity area may, with the approval of the Electricity Commissioners, enter into and carry into effect agreements and arrangements for, and with respect to, the management by the Company of the whole or part of the undertaking of such undertakers upon such terms and conditions as may be agreed between the Company and such undertakers.

[*Parliamentary Agents: Messrs. Sherwood & Co.*]

GAS LIGHT AND COKE COMPANY.

TRANSFER OF GRAYS AND PINNER UNDERTAKINGS.

Further amalgamations are proposed in the Bill of the Gas Light and Coke Company. The area of supply of the Company adjoins that of the Pinner Gas Company, Ltd., and is only separated from that of the Grays and Tilbury Gas Company by an intervening area of small extent. It is pointed out in the preamble that it would be to the advantage of the consumers of gas now supplied by the two last-named Companies that their undertakings should be amalgamated with that of the Gas Light and Coke Company; and the Company have agreed with them for the acquisition of their concerns. The consideration consists in the issue of ordinary and preference stock of the Gas Light and Coke Company to the holders of ordinary and preference shares in the Pinner and Grays Companies, and, in addition (in the case of the Pinner Company), in the transfer to the Gas Light and Coke Company of the outstanding mortgage debentures of the Pinner Company, and (in the case of the Grays Company) in the issue of debenture stock of the Gas Light and Coke Company to the holders of debenture stock of the Grays Company.

The date of transfer is Jan. 1, 1930. As soon as practicable after that date, the Gas Light and Coke Company will issue (in addition to the debenture stock already referred to) to the holders of "A" 10 p.ct. £10 ordinary shares, "B" 7 p.ct. £10 ordinary shares, or 6 p.ct. £10 preference shares in the Grays Company, ordinary stock or 4 p.ct. consolidated preference stock of the Gas Light and Coke Company, as follows: For each "A" 10 p.ct. £10 ordinary share, £18 10s. of ordinary stock of the Gas Light and Coke Company; for each "B" 7 p.ct. £10 ordinary share, £13 of ordinary stock of the Gas Light and Coke Company; for each 6 p.ct. £10 preference share, £15 of 4 p.ct. consolidated preference stock of the Gas Light and Coke Company; to holders of 5 p.ct. perpetual debenture stock, for every £100 of such stock the sum of £166 13s. 4d. of 3 p.ct. consolidated debenture stock of the Gas Light and Coke Company; to holders of 4 p.ct. perpetual debenture stock, for every £100 of such stock the sum of £133 6s. 8d. of 3 p.ct. consolidated debenture stock of the Gas Light and Coke Company; and to each holder of 6 p.ct. redeemable debenture stock, for every £100 of such stock the sum of £100 6 p.ct. redeemable debenture stock of the Gas Light and Coke Company.

In respect of the Pinner undertaking, the Gas Light and Coke Company (in addition to providing for the mortgage debentures) will issue to the holders of "A" 10 p.ct. £5 ordinary shares, "B" 7 p.ct. £5 ordinary shares, or 6 p.ct. £5 preference shares, ordinary stock or 4 p.ct. consolidated preference stock of the Gas Light and Coke Company as follows: For each "A" 10 p.ct. £5 ordinary share, the sum of £12 10s. of ordinary stock of the Gas Light and Coke Company; for each "B" 7 p.ct. £5 ordinary share, the sum of £8 15s. of ordinary stock of the Gas Light and Coke Company; and for each 6 p.ct. £5 preference share, the sum of £7 10s. of 4 p.ct. consolidated preference stock of the Gas Light and Coke Company. The mortgage debentures of the Pinner Company amounting to £12,700 bearing interest at the rate of 5 p.ct. per annum, £3200 bearing interest at the rate of 5½ p.ct., £14,550 bearing interest at the rate of 7 p.ct., and £20,000 bearing interest at the rate of 5¼ p.ct., or such of those mortgage debentures as may be outstanding at the date of transfer, shall become mortgage debentures of the Gas Light and Coke Company.

The Gas Light and Coke Company are to have power to create the necessary amounts of ordinary stock, consolidated preference stock, and debenture stocks as may be necessary to give effect to the provisions of the Act; and the stock so issued shall not affect the powers of the Company under their existing Acts and Orders of raising money.

The Gas Light and Coke Company will continue to pay all superannuation allowances, pensions, or other periodical sums granted, or payable by, the two Companies, under any superannuation, pension, benevolent, or other similar scheme, or otherwise. In the case of any staff officer of the Companies who enters the service of the Gas Light and Coke Company and joins the superannuation fund of that Company, the Gas Light and Coke Company shall, in calculating the period of his service for the purpose of any superannuation allowance of such officer upon his retirement from the service of the Gas Light and Coke Company take into account the continuous staff service of such officer with the Grays or the Pinner Company as if it had been service with the Gas Light and Coke Company.

As from the respective dates of the reading of the indices of the meters for the December quarter of the year 1929 measuring the gas supplied to the owners or occupiers (*a*) within a radius of a mile from the Grays Gas-Works or (*b*) in the Pinner district, the charge for gas shall be a price per therm exceeding by the following respective amounts the price for the time being charged by the Gas Light and Coke Company to private consumers in the part of their district which is north of the Thames, and did not immediately before Jan. 1, 1926, form part of the limits of supply of the Brentford Gas Company: From the commencement of the March quarter of 1930 to the end of the Christmas quarter of 1932, 3·4d. For each of the

nine years from the commencement of the March quarter of 1933 to the end of the Christmas quarter of 1941, an amount less by 0·2d. than the amount applicable to the preceding year. As from the respective dates of the reading of the meters for the Christmas quarter of 1941, the price to be charged for gas supplied to the Grays and Pinner consumers shall exceed by 1·4d. per therm the price for the time being charged by the Gas Light and Coke Company for gas supplied to their consumers north of the Thames, as already specified. As from the reading of the meters for the December quarter of 1929, in so much of the Grays district as is beyond the radius above referred to, the charge for gas shall be a price per therm exceeding by 1·2d. the price for the time being charged by the Gas Light and Coke Company for gas supplied to the Grays and Pinner consumers.

Unless and until the Gas Light and Coke Company otherwise declare, in accordance with the provisions of their Order of 1921, the declared calorific value of the gas supplied by them in the Grays and Pinner districts shall continue to be the calorific value as declared immediately before the date of transfer.

COMPENSATION TO DIRECTORS AND AUDITORS.

The Gas Light and Coke Company shall within one month after the date of transfer pay to each of the Directors of the Grays Company and the Pinner Company, as compensation for loss of office, a sum of money equivalent to seven years' purchase of the annual amount of their remuneration (with the income-tax thereon). To each of the Auditors is to be given a sum equal to three years' remuneration. If the Gas Light and Coke Company elect not to take over any staff officer of the other two Companies who shall be willing to enter their service, they shall pay to such officer, by way of compensation, such amount as may be agreed, or as, failing agreement, may be determined by an arbitrator.

TESTING OF DRIED GAS.

Among other sections contained in the Bill is the following.

> If and so long as the Gas Light and Coke Company apply to the gas supplied by them in any part of the limits of supply any process for the particular purpose of extracting therefrom the whole or part of the water vapour contained therein, or distribute any gas by any method which results in the extraction therefrom of the whole or part of the water vapour contained therein—
>
> (*a*) the Gas Referees shall, in making any prescription under sub-section 1 of section 5 of the Gas Regulation Act, 1920, with reference to such gas, have due regard to the fact that such process is applied thereto or such method of distribution is adopted; and
>
> (*b*) sub-section 7 of section 1 of the said Gas Regulation Act, 1920, in its application to the Gas Light and Coke Company shall have effect as if, in relation to the testing of such gas, the words "and containing such proportion (if any) of water vapour content as is contained in the gas as supplied to consumers" were substituted therein for the words "saturated with water vapour."

Power is taken to acquire further lands for gas purposes.

[*Parliamentary Agents: Messrs. Dyson, Bell, & Co.*]

Dunstan Coal Distillation Plant.—In the number of "Engineering" dated Dec. 21 there appears an illustrated description of the low-temperature coal distillation plant which has been installed by Messrs. Babcock & Wilcox, Ltd., of Farringdon Street, London, E.C., at the Dunstan Power Station of the Newcastle-on-Tyne Electric Supply Company, Ltd. This plant, particulars of which have already appeared in the pages of the "JOURNAL," was, it will be remembered, the subject of a paper read by Mr. R. P. Sloan at the recent World Power Fuel Conference—a paper which somewhat unexpectedly led to newspaper articles, heralding with joy the approach of "farthing electricity." Our contemporary understands that the plant has now been running for about a year, and that, in spite of its apparent complication, no difficulties have been encountered in operation. It does not, of course, necessarily follow that "farthing electricity" is on the way.

MacLaurin Plant at Dalmarnock.—In the "Engineer" for Dec. 14, Mr. J. B. C. Kershaw, F.I.C., records his impressions of a recent inspection of the MacLaurin plant at the Dalmarnock Gas-Works, Glasgow, and publishes figures taken from the annual reports of the Gas Department of the city, which show the financial results of the actual working of the plant for the two years ended May 31, 1928. The writer concludes his article thus: "Mr. MacLaurin is working upon the problem offered by the treatment of the oils produced by his process; and its future economic success would seem to depend very largely upon the results of his efforts. It may be stated that, although the capital expenditure upon the plant at Dalmarnock has amounted up to date to £47,588, that total does not include the working losses which have so far been incurred in its operation; but these have been carried to the debit side of the general revenue account of the Glasgow Corporation gas undertaking."

"K.S.G." LOW-TEMPERATURE CARBONIZATION PROCESS.

Plant Installed at the Works of the South Metropolitan Gas Company.

A "K.S.G." low-temperature carbonization plant of one large, standard, mechanically-continuous retort, with a normal throughput of about 550 tons of coal per week, is approaching completion at one of the works of the South Metropolitan Gas Company. The foundations were commenced last summer, and the retort, along with all the accessory condensing and bye-product plant, and the material for the requisite buildings, has, we understand, already been delivered on the site, and the erection is well advanced. Also, there is included a producer gas generator, with mechanically-operated ash-discharge gear, for supplying the gas to heat the setting and generate auxiliary power. In the producer, small coal, coke breeze, or any other cheap material, is employed, the rich gas being left available for addition to the town supply.

This is a further indication of the active interest now being taken by the gas industry in low-temperature carbonization. One of the most important claims for the "K.S.G." process is mechanically continuous operation, with consequent high throughput and low operating costs, for the direct conversion of bituminous coal dust and smalls into dense, hard, free-burning high-grade smokeless fuel in large pieces, without any complication, such as briquetting, mechanical compression of the hot plastic charge, or natural compression by confining the swelling charge in small intermittent retorts.

MECHANICAL HANDLING PLANT FOR SMALL WORKS.

Of special interest to the smaller works is the mechanical handling plant now being manufactured by W. J. Jenkins & Co., Ltd. Essentially designed for working on stop ends, the plant can be supplied as a complete unit; and with such it is possible for the heavy routine work in the retort house to be done entirely by machinery.

The two main features of the plant are the charging machine and rake. Both these machines are of the suspended type and electrically driven; the necessary current usually being supplied by a small generating set forming a part of the equipment.

The charging machine is of the well-known De Brouwer type so extensively used in the larger works. With this mechanism the quantity of coal projected into the retorts can be varied at will, and the operation of charging is so simple that any man can become expert in a few days—a very useful feature which country works considering the installation of machinery should bear in mind. The extraordinary speed of charging with the "D.B." projector ensures the gain of the fresh rich gases which with hand charging are lost, and the increase in make due to this is anything up to 1500 c.ft. per ton. The adaptation of the machine to stop-end work is a modern one; but the many works which have installed them have found the makers' claims have been more than justified.

The electrically driven rake is as simple as the charger. All movements are controlled by two levers, the operation of which enables the stokers effectively to clear the retorts of the resultant coke in much less time than can be done by hand. The rake bar is in two lengths, and, while having a forward and backward stroke, it is possible to raise or lower the bar so that the hinged head can either pass over the coke when entering the retort or dig into it when leaving.

The combination of the two machines forms an ideal means for saving money, as the initial cost is so low that the plant pays for itself in a very short period. This should make it a most attractive proposition for the stop-end works.

Burning Characteristics of Various Cokes.

An investigation which is being conducted at the Pittsburgh Experiment Station of the United States Bureau of Mines has included series of tests on several cokes in which the size of the coke, the rate of burning, and the size of the furnace were varied. The object of the tests was to determine whether the relation between the burning characteristics and the above variables are similar for all cokes. If this were so, then the data from one test would be sufficient for predicting what would be the results under other test conditions. One of the burning characteristics of coke is the amount of slot opening required for the admission of enough secondary air to bring the flue gas to an average definite composition; assuming the setting to be made once for all for the interval between firing periods. Curves were obtained showing that the amount of slot opening required increases with the rate of burning and decreases with increased size of coke pieces.

A MEANS OF INCREASING GAS MAKE WHILE MAINTAINING CALORIFIC VALUE.

By J. GÜLICH, of Jena.

Increased makes of gas of lower calorific value are, says the author, a common occurrence. What is required in Germany at the present time is a method of increasing gas makes from existing plant, while maintaining the calorific value. In a paper recently read before one of the German district associations, Herr Gülich described a method of achieving this which has been adopted with considerable success at Jena, and worked on a practical scale over a period. The following is an abstract translation of the paper, which was reproduced in "Das Gas- und Wasserfach" for Nov. 17.

The experiments described were carried out on ovens of 12 vertical retorts each, 4 metres (13 ft.) in depth. No extra supervision was provided with a view to improving the results, and the condition of the plant was such that it was very nearly due for reconstruction or replacement. The principle adopted was to place a layer of coke on top of the correspondingly reduced coal charge. A suitable depth of coke was found to be a minimum of 700 mm. (28 in.), and a convenient size was the pearl coke produced on the works—viz., 10 to 20 mm. (0·39 to 0·78 in.). The grading should be as consistent as possible, in order to attain as nearly as possible the most favourable proportion of fuel contents and gas space. In this way there is a maximum of gas space without the formation of unequal hollows in the coke bed, or too easy a passage for the gas. Also, the smaller the pieces of coke, the greater relatively is the surface. For the same reason, a coal grading of 40 mm. (1·5 in.) was used as far as possible, though at times a high proportion of smalls had to be employed. At all events, the coke should be as free as possible from dust, so that the gas may have a regular and free passage.

STEAMING.

It had previously been customary to steam at the end of the tenth hour onwards. With the new method of charging, it was found that steaming could begin with every success after only seven hours, without any drop in calorific value, which was maintained at 4600 to 4670 cal. (525 B.Th.U.). Moreover, steaming was not continuous, but was suspended every alternate half-hour, to correct the cooling effect in the retorts. Superheated steam was used, entering the retort at 0·5 atmos. (21 lbs. per sq. in.) pressure, and the quantity amounted to between 5·65 and 6·25 kilos. (12·4 to 13·8 lbs.) per retort per hour. The oven temperature was maintained at 1140° to 1180° C. The exhausters were not regulated according to the calorific value, but steaming was increased or diminished to maintain it at a steady level, and the exhausters were worked accordingly.

EFFECT OF THE COKE LAYER.

In introducing the layer of coke on top of the coal charge, the principal effect aimed at was the retention of the tar vapours as they left the coal, in order to submit them to further distillation in the retort, so increasing gas make and gaseous therms. It was argued that the greater porosity of the coke and its relatively larger surface in proportion to volume would give it also a greater capacity for adsorption. It was also hoped to eliminate the excessive caking usually to be observed in the upper layers of coal, and the consequent increase of pressure in the retort, which naturally cause loss of gas. In the third place, it was an attempt to effect a more rapid conveyance of heat to the contents of the retort by way of the layer of coke.

As regards the reduction of pressure, this was actually effected. In all the numerous tests made, only during the first two hours after charging were there found maximum values of + 60 to + 12 mm. (2·34 to 0·47 in.) water column; thereafter the pressure sank to ± 0. The value of the coke layer in this respect was particularly obvious when carbonizing small coals. The more rapid conveyance of heat to the interior of the retort was only proved. Only 2½ hours after charging, the lower third or even half of the coke column was already at bright glow-heat, and three-quarters of it after 3½ hours. On the other hand, even after 3½ hours no glow-heat was to be observed at all in the upper layers of the coal.

GAS PRODUCTION AND ANALYSIS.

The results as regards gas make, calorific value, and analysis are recorded in the paper in a series of graphs. Samples were taken in the stand pipes before the hydraulic main, and numerous tests made over varying working periods. The make was increased, generally speaking, by about 20 p.ct. as compared with the normal carbonizing process, while the calorific value was maintained. A characteristic noted in every case in the new process was a striking increase, as compared with the old, in the heavy hydrocarbons during the early part of the carbonizing period. As already explained, the coke layer is at glow-heat quite early in the process, and it is assumed that the tar vapours evolved during this period and adsorbed by the coke are probably dissociated by some catalytic action and passed on as gas.

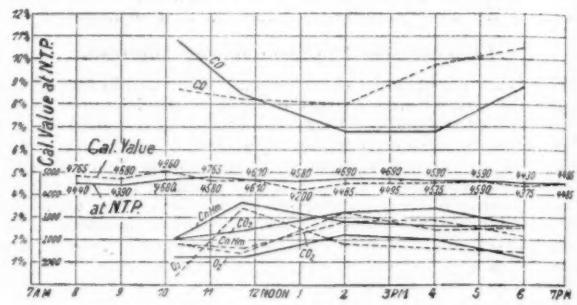


Fig. 1.—Comparative Analyses of Gases Produced at Jena.

In fig. 1 are shown some of the results of the finished gas over a two-day test. In this case the charge for the ordinary process (dotted line) was 480 kilos. of coal, and for the new process (solid line) 406 kilos. of coal, with a top layer of 55 kilos. of coke. Here the favourable proportion of heavy hydrocarbons in the new process is clearly seen, and its characteristic rise in the first half, and maintenance in the second. The steadiness of the curves from 14 o'clock (2 p.m.) onwards is explained probably by the fact that no charging of retorts is done between 2 p.m. and 7 p.m. The CO in this case averages for the new process 8·32 p.ct., for the old 9·02 p.ct. The two curves intersect at first—*i.e.*, during charging hours—the new process curve falling sharply, to rise again during non-charging hours, and continue near the other. The highest and lowest CO percentages are with the new process, where 10·8 p.ct. is reached early on, and 6·8 p.ct. in the second half. With the old process, the highest of 10·5 p.ct. is in the second half, and the lowest of 8 p.ct. in the first. The contrary courses of the CO and CO_2 curves are clearly seen. The average CO_2 in the new process is 2·72 p.ct., and 2·3 p.ct. in the old. The new has the lower average for oxygen of 1·56 against 1·72 p.ct. Calorific values run fairly equally in the two processes; the new varying between 4765 and 4390 cal., and the old between 4960 and 4200. The gas make throughout at the tests showed an increase of approximately 20 p.ct. with the new method.

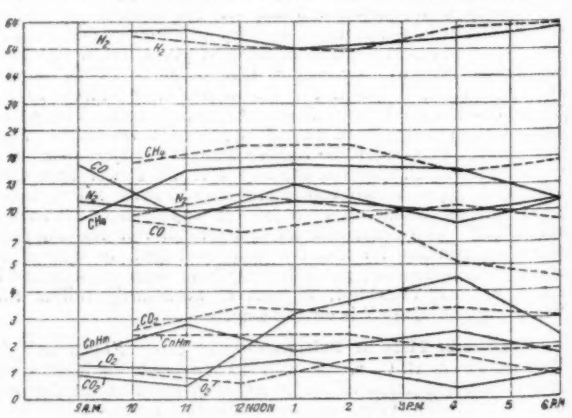


Fig. 2.—Further Analyses for a Different Period.

In fig. 2, further analytical results are given, taken over another two-day period. Charges were the same as before. The characteristics already noted are seen again in this instance, and the hydrogen, methane, and nitrogen curves are also given. Both processes satisfy the requirements of the standards recommended by the German Gas Association, which include a limit for inerts of 12 p.ct.

COKE, TAR, AND PRODUCER FUEL.

In order to see whether the process has any effect on coke make, frequent weighings were made, and it was found to

run between 67·3 and 69·1 p.ct. Tar make was reduced, though no exact statistics have yet been compiled. There was not nearly the same tar incrustation of the stand pipes as formerly. Hard tar deposits at the heads vanished. The tar hardened very much more rapidly on exposure to the air. Producer fuel requirements naturally increased, as the process demands greater heat consumption, and the maintenance of temperatures is of great importance. The coke used as top layer in the retorts is for the most part recovered, and it appears, if the cover is removed at charging time, as an even bed with the coke size still defined. Herr Gülich hopes, with new settings of vertical chambers shortly to be taken into use, to attain a make of 54 to 56 cub.m. (20,000 c.ft. per ton).

Other Possible Variations.

In conclusion, the author referred briefly to another variation of the new process with which experiments have only recently been begun. It consists in introducing a second coke layer half way down the coal charge, with provision for steaming at this point as well as at the bottom of the retort. Detailed results are not yet available. By thus enlarging the steaming basis, and by steaming simultaneously at the two points, or alternately, as the temperatures in the two zones are most favourable, still better results are anticipated, especially with the big charges which are nowadays carbonized in vertical chambers. The Dessauer Vertikalofengesellschaft have applied for patents for this process in all its possible variations, and, quite independently of Jena, they are said to have obtained excellent results in tests at other works. One interesting proposal is to work with chambers in pairs, one containing coal and the other coke. The gas from the coal chamber would filter upwards through the coke chamber, and steaming would be provided for at the bottom of the coal chamber, and at the bottom of, and half-way up, the coke retort.

AMERICAN GAS ASSOCIATION CONVENTION.

(*Continued from Vol.* 184, *p.* 860.)

Gas for Home Laundry Work.

A Committee appointed to perform the task of awakening the gas industry to a full realization of the importance of laundry work in the domestic load scheme, draw attention to the fact that keeping laundry work at home, through the use of gas-heated domestic laundry appliances, offers a decidedly attractive direct load by the use of these appliances, and indirectly advances the use of every other domestic application for gas. The maximum load possible from any domestic appliance depends upon the use of the home by the family. Laundering is one of the few household duties which fixes at least one day each week when the home will be used. About 17,200 c.ft. (550 B.Th.U.) a year is the minimum average load to be secured from a complete gas-heated laundry unit, in a home of four people, where the washing is done on an average of forty weeks a year—an average consumption of 107½ c.ft. per person each wash day. Now 6000 c.ft. of this 17,200 c.ft. comes directly from the water heater, 10,000 c.ft. from the dryer, and the remaining 1200 c.ft. from the washer and ironer.

These figures are a minimum average of the results of a series of tests conducted by the Committee. The tests were made on actual installations by the use of gas meters on the appliances in the laundry, and cover an average of six wash days.

A "Class" Rate for Water Heating.

To one Sub-Committee was assigned the duty of making a study of the relation between gas rates and sales of storage water heaters, and of the results obtained from the introduction of "class" rates designed to encourage the water heating business. A survey was conducted recently for the Association, and among other things an investigation was made as to why more automatic water heaters are not purchased and used. This survey indicated that, while only 9 p.ct. of the customers not using water heaters preferred coal for heating water, 50·4 p.ct. would not purchase heaters on account of the first cost, and 42·5 p.ct. on account of the cost of operation. In other words, almost half of the customers not owning water heaters gave as their reason that the cost of operation was believed to be too great.

Details are given by the Sub-Committee of results obtained in one small city during the past two years with a "class" rate for water heating. This city is located in one of the Middle Western States, and is similar to hundreds of others in America. It is a place inhabited largely by retired farmers and small business men. There are only two or three small manufacturing plants; and they are not very prosperous, nor do they pay very high wages. The purchasing power of the average citizen is thus rather limited; but there are a considerable number who can, and will, pay a reasonable amount for comforts. The town is not growing to any extent. At the end of 1927 there was a total of 1075 gas meters installed. For some time the gas business in the town seemed to be in a stagnant condition. Revenues and sales were tending to stand still or slip backward. A survey indicated that there were only two automatic water heaters in use. The rate for gas was $1.75 net per 1000 c.ft. for the first 50,000 c.ft. per month, and, of course, in most cases that meant all consumption. It seemed impossible to reduce the rate for the general customers; for even at this relatively high rate the property was earning only about 2½ p.ct. on the tax value. This condition was largely due to the fact that the city was served by a small local gas manufacturing plant, the cost of production by which was necessarily very high.

Finally, it was decided to introduce an out-and-out "class" rate to domestic customers using storage type automatic water heaters. This rate was as follows:

Service charge	$1 per month
First 2000 c.ft.	$1.25 net per 1000 c.ft.
Excess over 2000 c.ft. . . .	$1 net per 1000 c.ft.

This new rate became effective on July 1, 1926; and some storage type water heaters were sold during July, August, and September, but were rather late in being installed, so that the resulting sales and revenue probably did not have a very great effect upon the business in that year. However, during 1927 a considerable number of additional heaters were sold. For the latter part of 1926 and all of 1927 there were installed 86 water heaters, which represents almost 10 p.ct. of the domestic customers. During the first six months of 1928, 19 heaters were sold. From the structure of the rate, it will be noted that these customers were enabled to buy all the gas used by their water heaters at a price of $1 net per 1000 c.ft., instead of at $1.75 net.

Now as to the increased sales and revenue which have developed since the introduction of this rate. A large part of this increased use can be traced directly to the water heaters; but no doubt some of it is due to a freer use of gas for other purposes by customers who purchase their gas under this rate, and who know that all over the minimum will cost only $1 per 1000 c.ft. The increase in sales and revenue for the past several years when compared with the sales and revenue for the year preceding has been as follows:

	Percentage Increase.	
	Sales.	Revenue.
1926 over 1925	1·5 ..	0·04
1927 over 1926	20·1 ..	15·1
First six months of 1928 over 1927 . .	11·8 ..	9·8

The above covers only commercial and domestic sales and revenue; the industrial sales and revenue for all periods having been eliminated. It was impossible to separate commercial and domestic business, as the records had not been kept apart during the whole of that period.

Steere Automatic Grate.

The Builders' Section of the report of the Water Gas Committee contains an account of developments in connection with the Steere automatic grate, which consists of an assembly of conically-shaped segments; each segment being made-up of discs and spacers, which vary in number and dimensions according to the size of the generator in which the grate is installed. The segments are rotated by hydraulic cylinders, each of which operates several segments. All energy required for the working of the grate is derived from the hydraulic system which operates the machine. The rate of turning the segments can be regulated to meet varying conditions resulting from the use of different types and grades of fuel. The revolving action of the grate is intermittent; and the usual practice is to move the segments a small fraction of a revolution once during each cycle of the water gas machine. Only the efficient removal of clinker immediately above the grate is contemplated with this device. To eliminate the formation of side-wall clinker, and to place all clinker within reach of the revolving grate, a system of sprays is installed in the generator wall at the height where side-wall clinker is normally formed. A small amount of water is introduced through the sprays during each cycle. Experience indicates that this water does not harm the lining. In fact, it produces a protective coating. The water is controlled by the automatic mechanism which operates the machine.

It is pointed out that the Steere grate does away with the hardest labour in connection with a water gas plant—*i.e.*, clinkering and barring down. It thus brings about a substantial reduction in labour costs. The uniform depth and structure of the fuel bed and its increased active area produce larger volumes, and an improved grade, of blue gas. The capacity of the plant is also greatly increased over a 24-hour period of operation, by converting the usual clinkering and barring down periods into gas-making time.

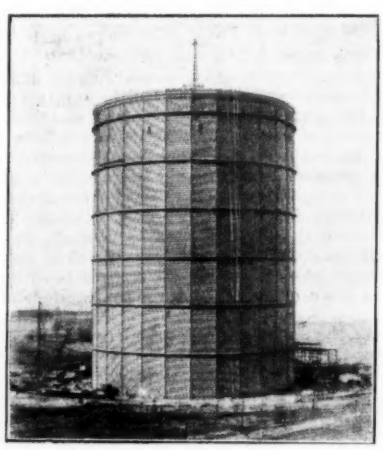
A 20-MILLION WATERLESS HOLDER AT CHICAGO.

From the "American Gas Journal" for December, 1928.

A 20-million c.ft. waterless holder—the largest in the history of the gas industry, and the first to be marked and lighted from official aeronautics specifications for protection against aircraft and guidance of air traffic—has just been completed in Chicago.

The huge structure is 416 ft. high, exclusive of a 70-ft. tower, has an over-all diameter of 283 ft., and is situated beside a giant gas main, 4 ft. in diameter, which runs for over 33 miles along the western and southern flanks of Chicago.

The holder is located in the south-western section of the City, two miles south-east of the Chicago Municipal Airport. The Peoples Gas Light and Coke Company co-operated directly with aviation authorities in the Department of Commerce at Washington and with local air transport interests in painting, lighting, and otherwise marking the holder.



The New 20-Million C.Ft. Waterless Holder at Chicago.

This is the first time that the builders of any industrial structure have called upon the federal aeronautics officials to design the collateral aviation-aid details. The obstacle lights and daytime markings have full government and local approval. As a result of this co-ordination, the Company's policy of making its holders as inconspicuous as possible has been entirely reversed. The new "gas tower" is painted a vivid sage green, a colour that looms out through hazy atmosphere, and does not blend with sky or land background.

The upper part, 30 ft. down from the cornice, is painted in three horizontal bands of chrome yellow and black in equal widths. In chrome yellow, on the solid black face of the roof, is painted, "Chicago Municipal Airport 2 Miles," in 30-ft. letters, with an arrow, also chrome yellow, the entire diameter of the holder, indicating the direction. At night the arrow is brilliantly floodlighted.

Floodlighting.

A cluster of red lights, consisting of a single thousand-watt light encircled by 14 150-watt lights immediately below it, surmount the 70-ft. tower. Around the cornice, at every other of 28 bays, is another 150-watt red light and, halfway down the side of the holder, still another one below each of the cornice lights. All of these 53 lights are encased in special refracting and reflecting obstacle light globes with prisms which intensify the candlepower of the bare lamps progressively so that the light appears equally bright from any position and gives a strong, narrow beam directly upward. The lights are turned on and off at dusk and dawn by an astronomical clock. In addition, a photo-electric device, controlled by intensity of light in the surrounding atmosphere, turns the lights on and off during the daytime when unusual darkness occasions it.

Under ordinary atmospheric conditions the tower light is visible from five to ten miles away. Exceptionally clear nights increase the visibility-distance to about 15 miles.

Artistic Treatment.

Because of the prominence of the holder in the community due to the aviation markings—and due, too, in no small way to its immense size—it has been treated architecturally for sightliness. The 70-ft. tower was added to enhance the silhouette, and there are ornamental spiked railings around the top of the roof ventilator, and another row protruding upward from the cornice. A raised ornamental frieze runs round the circumference of the holder just below the cornice. The grounds about the holder are to be graded and appropriately landscaped.

The new holder brings the total storage capacity of the Peoples Company to 108 million c.ft., which is practically an average day's send-out, and only a little less than 75 p.ct. of the present maximum 24-hour demand.

In addition to the holder, the site has a compressor house with a 24-hour potential distribution capacity of 36 million c.ft., provided by two 500 horsepower units, each with an hourly capacity of 750,000 c.ft. The Company's 15 million c.ft. waterless holder in the north-west section of the city—also tied in with the 33-mile 4-ft. main—is served with a pumping station of equal size.

The size of the Company's previous holders was based on minimum existing necessity. On that basis, the present new holder would have been merely a duplication of the Company's 15 million c.ft. holder completed two years ago. But in planning this new one, great emphasis was placed on the possibility of reducing investment cost per 1000 c.ft. of holder capacity as send-out and, consequently, storage capacity, increased in the future.

Operating Staff.

Though the initial cost is relatively greater, a 20 million c.ft. holder costs no more than a 15 million c.ft. one as far as operating cost and regular maintenance expenses are concerned. A minimum operating shift of two men—an engineer and an assistant—is all that is required for the new holder and pumping station. The regular maintenance crew consists of only two men—one to oil and care for the mechanical equipment and another to keep the grounds and compressor house in order.

The size of the holder was not based entirely on this one factor, however. It affords facility for storing greater quantities of purchased by-product gas, obtainable from the steel mills in the district just south-east of the holder, among other advantages.

A 24-in. main recently was laid from a South Chicago steel mill which brings in 11 million c.ft. of purchased gas daily. It is expected that this amount can be increased to 20 million c.ft. within six months.

At that time, the 11 million c.ft. addition of by-product gas from this single source represented an increase of over 25 p.ct. in the Company's total purchased gas, raising the amount to an average of 51 million c.ft. daily. This volume will be increased in the near future to approximately 70 million c.ft., or almost 50 p.ct. of the present combined outputs of the eight Peoples gas production stations. The new holder is an important and significant addition to the facilities for ensuring an adequate supply of gas in Chicago and adjacent districts. In this respect it is another step in the continued development of a recently inaugurated "super-gas" service in the Chicago district.

To Direct Airmen.

The Peoples Company system is interconnected with the main-and-holder system of the Public Service Company of Northern Illinois—Chicago's neighbouring utility on the north and west which supplies gas to Evanston, Oak Park, Cicero, Blue Island, Chicago Heights, Harvey, and many other intervening suburbs adjacent to Chicago—and with that of the Northern Indiana Public Service Company, which supplies the industrial district just over the state line—Hammond, East Chicago, Whiting, Indiana Harbour, and other manufacturing communities.

The Public Service Company of Northern Illinois has in this territory holder capacity of 17 million c.ft., and the Northern

Indiana Public Service Company has holder capacity of 14 million c.ft., which are, for all practicable purposes, adjuncts of the interconnected system.

DIMENSIONS.

For the statistically-minded, here are some facts about the holder which, for the ever-fleeting present, is the world's largest:

It is a 28-sided polygon with an over-all diameter of 283 ft., and an over-all height, including the tower, of 490 ft. It is 382 ft. high to the eaves; 405 ft. high to the top of the roof; 417 ft. high to the top of the roof ventilator; and 490 ft. high to the top of the beacon tower. Five thousand five hundred tons of steel and 1,863,000 rivets, ranging in size from three-eighths to seven-eighths inch were used in its construction. One hundred thousand gallons of tar were used for sealing. The height is made up of 141 courses of steel plates.

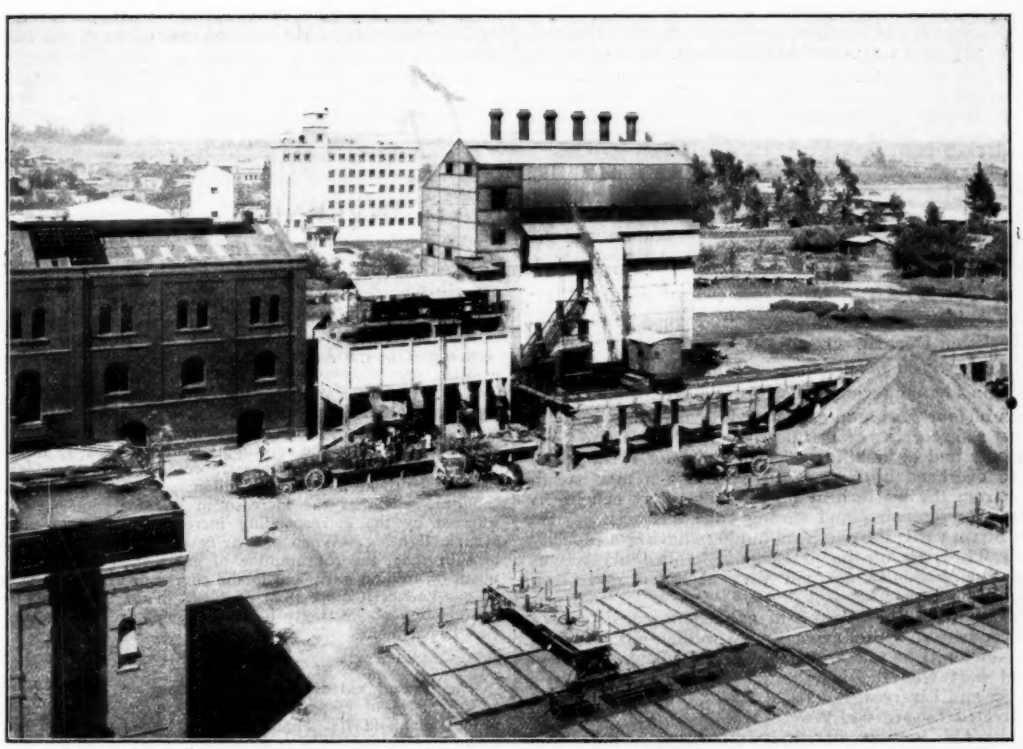
There are six galleries about 60 ft. apart all around the holder. Seven electrically-operated pumps are spaced around the holder to pump the sealing tar. It is equipped with inside and outside elevators, electrically-operated. The red obstacle lights and floodlighting of the roof have a total wattage of 8500.

The length of time in which the holder and accoutrements were constructed by The Bartlett Hayward Company, of Baltimore, Maryland, is another factor which distinguishes the project. It was a world's record for speed on any comparable type of steel construction.

Ground was broken on March 29, 1928. The first piling was driven April 9. On June 11, the first steel was laid, and the bottom was lowered June 23—twelve days. Erection of the piston trusses was started on July 2 and completed on July 9—seven days. The roof trusses were erected from July 14 to July 22—eight days. On Aug. 11 the first part of the shell was started, and the top was reached on Sept. 17—thirty-seven days. The holder was purged Nov. 15—one hundred and fifty-seven days after steel was first laid.

GAS-WORKS AT SANTIAGO DE CHILI.

By Senor WALTER MÜLLER, Chief Engineer of the Compania de Consumidores de Gas de Santiago.



Santiago, the third largest city in South America, and the capital of Chile, was founded by Pedro de Valdivia in 1541. To-day this city presents a prosperous appearance, with magnificent modern buildings, well-paved streets, up-to-date service of traction and telephone, and abundant commercial facilities. Lying on a level plain, eight square miles in area and 1700 ft. above sea level, surrounded by the Andes Cordillera, it is situated some ninety miles from its principal port, Valparaiso.

The railway systems branching from Santiago connect with Northern and Southern Chile to such towns as Antofagasta, Iquique, Arica, San Antonio, and Concepcion, the important connecting link with the Argentine Republic being the Transandine Railway, commencing from the town of Los Andes, within easy reach of Santiago. This railroad skirts the mountain chain of the Andes and represents a magnificent feat of engineering, the railway reaching its highest point 10,450 ft. above the sea level.

Santiago, whose population is approximately 508,000, is rapidly becoming one of the foremost cities of South America, and has already played a great part in the history and administration of the Chilian Republic. Chile, it is interesting to note, was the first republic in South America to use coal gas; the first charter to the present Compania de Consumidores de Gas de Santiago having been given in 1856—the actual use of gas commencing ten years later.

The first works for the production of gas were established at San Miguel within the city boundary, but, as the undertaking grew, these works became inadequate owing to the shortage of ground space to accommodate additional plant. New works were therefore erected at San Borja, some three miles from the centre of the city; gas being made in inclined retorts. Both works were used conjointly for the production of the requirements of gas for the city. As time went on, however, it became apparent that the carbonizing plant was inadequate; and it was decided that a new plant should be erected at the San Borja Works, and that the San Miguel Works should be used as a storage and pressure station only. The Chief Engineer, Señor Walter Müller, was, therefore, commissioned to visit Europe, and, in consultation with the Company's London Engineer, Mr. Henry T. Armitt, M.Inst.C.E., to study modern methods for the carbonization of coal, particularly those methods which could be employed in the effective carbonization of the local Chilian coals.

After a complete investigation, which included the carbonization of a cargo of Schwager coal in the research gas plant at Miles Platting, the Glover-West system was adopted as being the most suitable, and a contract was placed for an installation of Glover-West vertical retorts having a nominal capacity of 84,000 cub.m. of gas per day at a calorific value of 4500 cal. per cub.m.

The installation, which commenced work in May, 1927, consists of six settings of the 33-in. by 10-in. steaming retort arranged in units of fours—48 retorts in all. Coal is received into the works in trucks, containing 20 to 30 metric tonnes of coal, which are moved about the works by two small locomotives. The trucks are either unloaded by hand into the coal-hopper of the vertical installation or discharged by means of an electric grab crane into the outside coal stores. The coal stores, which have a capacity of 20,000 tons of coal, are

arranged in bays having walls of reinforced concrete, so that all deliveries may be classified, and a large stock carried in case of failure of supplies. Encircling these stores is the reinforced concrete crane gantry, so that the electric grab may pick up or deposit coal at will, without the addition of extra labour.

The coal as delivered is generally run-of-mine, and, before being elevated to the overhead coal bunkers, passes through a double-claw coal breaker which delivers broken coal to a lip-bucket conveyor, without any type of mechanical filler.

The West lip-bucket conveyor, which has a capacity of 30 tons of coal per hour, delivers coal at the bunker level into a push-plate conveyor traversing the coal bunkers. It is so designed that coke can be elevated to the producer and retort-filling coke hoppers.

The surplus coke is discharged from the retorts into skips, which are picked up by another electric crane running on the extended gantry from the coal stores. This crane can deposit the coke into stock or to the coke screens as required—the coke screens are of the rotary type electrically driven. From the screens the coke is graded into hoppers of reinforced concrete design.

The installation is also arranged for the recovery of waste heat from the flue gases leaving the settings, and two waste-heat boilers of the Kirke type are installed. The steam produced from the waste-heat recovery plant is utilized for the production of the necessary electricity required in the running of the various motors, and for this purpose two 70 KW. dynamos are provided (one to act as stand-by) driven by two 105 B.H.P. Browett-Lindley high-speed steam engines. An arrangement is also provided whereby the surplus steam can be delivered to the ordinary works supply.

The installation carbonizes daily a regular supply of Chilian coal from the Schwager Mines at Concepcion, in the south of Chile. Over a test period the results obtained were considerably above the guaranteed output, and a regular make per ton of 550 cub.m., at a calorific value of 4400 cal. per cub.m., is being obtained. The auxiliary plant of the works is modern and up-to-date; the feature of particular interest being the waterless gasholder, which has a nominal capacity of 30,000 cub.m. The plant also includes an extensive chemical works, in which tar and ammonia products are worked up.

The rapid growth of the undertaking is indicated by the following figures, giving the annual output of gas at intervals of 20 years:

1885—	2,400,000 cub.m.	= 83,756,000 c.ft.
1905—	10,250,000 ,,	= 362,000,000 ,,
1925—	21,995,000 ,,	= 776,753,000 ,,

This growth continues; and in August of this year it was decided to proceed immediately with a further extension. Another contract was, therefore, placed with West's Gas Improvement Company, Ltd., for the addition of 32 Glover-West vertical retorts of the same type as those in the original installation, complete with further waste-heat recovery plant and the necessary additions and extensions of the coal-handling plant.

PLANT EXTENSION AT INVERNESS.

Formal Inauguration.

There was an interesting ceremony at the Inverness Corporation Gas-Works on Dec. 20, when Provost A. M. MacEwen set in motion the newly-installed extensions to the plant, erected at a cost of considerably over £20,000. The extensions consist of one bench of four seven-ton capacity vertical retorts, capable of producing 426,000 c.ft. of gas per day, with coal and coke storage hoppers and an auxiliary electric hoist for raising coal and coke to overhead bunkers. There is also a new steam boiler, fired from the waste heat flues of the retort bench. A modern plant for screening and storing coke has been erected in the Rose Street yard; the overhead bunkers having a capacity of 60 tons. The part of the extensions detailed above was entrusted to the Woodall-Duckham Vertical Retort and Oven Construction Company, Ltd.

The second part of the scheme of extensions consists of a water tube condenser, with a capacity of 1 million c.ft. per day, by Messrs. Newton, Chambers, & Co., Ltd., Sheffield. Included in the third part was the installation of a half-million per day Davidson and Liversedge vertical washer, which was supplied and erected by Messrs. W. C. Holmes & Co., Ltd., of Huddersfield. This new washer, it is interesting to note, was partly designed and patented by Dr. Davidson.

The fourth part of the scheme consists of a set of four purifiers with connectionless valves, arranged on a stage floor with overhead revivifying floor; also an oxide disintegrator and bucket elevator. The contract for this was placed with Messrs. Robert Dempster & Sons, Ltd., of Elland; the iron plates for the bottom, sides, and decking being cast and erected by the Rose Street Foundry and Engineering Company, Inverness. The total cost of the scheme of extensions was £20,451.

OPENING CEREMONY.

The opening ceremony was attended by members of the Town Council and officials, together with representatives from the contracting firms. The visitors included Mr. J. Barker (Engineer and Manager, Nairn); ex-Provost Douglas (Chairman of the Forres Gas Company), and Mr. Wm. Williamson (Engineer and Manager, Forres). Mr. B. G. Hoare, Convener of the Gas-Works Committee, presided, and gave a brief outline of the nature and purpose of the extensions. He then called upon Provost MacEwen to set the plant in motion. The Councillors and visitors were thereafter conducted over the works, with particular attention to the new plant, and gained an interesting insight into the manufacture and storage of gas.

The company afterwards adjourned to the showrooms, where light refreshments were served.

Provost MACEWEN, proposing continued prosperity to the Gas Department, said that Mr. J. Thomson, the Council's first Gas Manager, and his son, Mr. A. Thomson, the present Manager, were really the men who had created the Inverness gas undertaking, and the Council were indebted to them for the great developments that had taken place in connection with it. They had also been fortunate in the various gentlemen they had as conveners of the Gas-Works Committee, and their present Convener, Mr. Hoare, had taken a very active part in the recent extension, and made himself familiar with it all.

It was now over 100 years ago since gas was first introduced into the town of Inverness. It was first of all in the hands of a private company, and in 1875 the undertaking was taken over by the Corporation. At that time the consumption of gas was 17 million c.ft. per annum. Now, to show the extraordinary increase which had taken place since then, it was 157 million. Another remarkable thing, he thought, was that the increase in gas had not been in any way affected by the corresponding increase which had taken place in electric lighting. When electricity was first introduced into Inverness in 1905, the consumption of gas was in the neighbourhood of about 75 million c.ft., and in the course of 23 years the consumption of gas had been more than doubled. Thus they could say that the introduction of electricity had in no way an adverse effect on their Gas Department.

REDUCTION IN PRICE.

The present extension, Provost MacEwen proceeded, was going to cost a lot of money, but that would be reflected in economy in production; and Mr. Thomson hoped before very long to be able to make a reduction in the price of gas. Gas, nowadays, was used very extensively for cooking and heating purposes, and was a great boon to the working classes, as was shown by the large amount of revenue —£13,000 a year, he believed—which the Inverness undertaking derived from consumers with shilling-in-the-slot meters.

Mr. B. G. HOARE, in the course of some general remarks on the undertaking, said gas was introduced to Inverness in 1826 by the Inverness Gas and Water Company. At present there were 5250 consumers on the books, of which 2700 were supplied by prepayment meters; the amount collected per annum in shillings and pennies being £13,533.

PRESENTATION.

In the absence of ex-Bailie Lindsay, ex-Provost Petrie presented to Provost MacEwen, as a memento of the occasion, a cigarette-box, made out of coal mined in Korea.

Ex-Provost PETRIE, in making the presentation, said he was very glad to be associated with the ceremony. There was no necessity to enlarge upon Provost MacEwen's qualities; he was well known to all of them, and the interest he took in the town's affairs was very much appreciated.

Provost MACEWEN expressed his thanks for the gift.

Bailie Sir DONALD MACDONALD, giving the toast of "The Contractors," said he was sure they would all agree, after their inspection of the new plant, that it was a sound job, and of good workmanship. They had also to congratulate the contractors on having the work done to time.

Mr. L. L. BEALE, of the Woodall-Duckham Company, replied.

The health of the Convener of the Gas-Works Committee was proposed by Mr. A. A. NOBLE, after which Mr. Hoare was presented with a pair of vases as a souvenir of the occasion. The toast of the "Visitors and the Gas Industry" was proposed by Bailie J. A. SMITH, and replied to by Mr. JOHN GORDON. Mr. Thomson and his staff were accorded a hearty vote of thanks for the reception they had given the company.

THERMAL STORAGE.

British Development.

A problem in steam raising, almost as important as efficient combustion itself, is that of maintaining a regular load on the boilers despite the fluctuating demands that may occur from time to time throughout the operating day. There are few steam-raising installations where the steam demand is constant; and hence, while an installation may be operated at high efficiency on full load, there are periods when the lightness of the load calls for small steam output and involves low efficiency. Nevertheless the capacity of the plant must be equal to that of the peak of the load.

In cases like this (and they are numerous) it is apparent that any method has a high value which will enable the plant to operate at normal output during periods of low load, and conserve the heat for use during periods of peak load. Such a process not only secures much more efficient working through the whole period, but allows much higher peak demands to be met without increasing the capacity of the plant. Fortunately the steam accumulator, which has come so prominently to the front of late, affords this facility. During the last few years attention has been consistently directed to methods of steam-heat accumulation, in which the surplus steam generated during periods of normal operation on light load is condensed to water in order to conserve the heat. In this system, when the demand for steam is greater than the normal steaming rate of the plant, the pressure is allowed to fall, and the water evaporates and is used as steam at lower pressure to augment the steam from the boilers. Since, however, the water in which the heat is thus accumulated cannot be evaporated except by reducing the pressure imposed upon it, the system is only readily adapted to works requiring two or more pressures. It will be appreciated that in this method the accumulator shells must necessarily be large, as they must hold sufficient water to condense all the surplus incoming steam.

THE KIESSELBACH SYSTEM OF THERMAL STORAGE.

Distinct from this system of falling or variable-pressure accumulation is the constant-pressure system. The latter system possesses distinct advantages in many industries where single pressures, as well as more than one pressure, are used. Under this heading comes Dr. Kiesselbach's system, the rights of which are being taken over by a Company now being registered which will operate the system and manufacture the plant in this country. The system consists primarily of a storage tank in which water is accumulated and maintained at both boiler temperature and pressure. The accumulator is in direct contact with water in the boiler, by means of an overflow pipe from the boiler, which maintains constant water level; and the water is circulated from the boiler to the accumulator, and from this storage-vessel back to the boiler, by means of a pump. The normal feed water pump is controlled by a pressure-operated regulator connecting the feed pump and the live steam delivery line, and the feed pump then operates in accordance with the rise in boiler pressure. A pressure equilibrium pipe admits steam from the boiler on to the top of the water in the accumulator, and ensures that the accumulated water is maintained at boiler pressure and temperature. The system is simple.

METHOD OF OPERATION.

Under conditions of normal operation of the boiler, the circulating pump runs normally; the feed pump passing the same quantity of water as is being evaporated. In the event of a decreased demand on the steam line, the pressure tends to rise, and the automatic regulator between the live steam line and the feed pump supplying the boiler opens, admitting more steam to the feed pump and increasing the speed and the quantity delivered. The consequent rise of water level in the boiler causes an overflow of water to the accumulator, and the low-temperature water admitted to the boiler tends to lower the pressure. As the demand for steam increases, the pressure tends to fall, with the result that the boiler feed pump is slowed down while evaporation in the boiler continues. At the same time, water which is at full boiler temperature and pressure is circulated from the accumulator, and flows to the boiler and back to the accumulator. In this way the water level in the accumulator continues to fall at the exact rate at which it is being evaporated; but during this period of excessive evaporation, the boiler is fed with water at boiler temperature and pressure, and consequently only the latent heat to convert this water to steam at the same temperature has to be added. When the period of excessive steam demand is passed, evaporation again becomes normal; the pressure regulator admitting water from the feed pump, restoring the water level in both the boiler and the accumulator.

It is claimed for the system that it has all the advantages of constant rate of firing irrespective of the demand for steam, and the maintenance of constant combustion conditions at the highest efficiency regardless of steam output. Moreover, constant boiler pressures are easily maintained under the heaviest fluctuations of load. Not only may the full output be maintained on a reduced number of boilers, but the mechanical circulation, causing a velocity of flow in the water tubes of the boilers, sweeps all sediment and steam bubbles off the heating surface, with consequent increased efficiency of heat transference.

The new Company which is about to be registered, with a capital of £220,000, for acquiring and operating the British and American patents and rights, is Kiesselbach Steam Accumulators, Ltd. An experienced Board has been appointed, and International Combustion, Ltd., are closely associated with the Company exploiting the system.

THE FUTURE OF COAL IN RELATION TO THE GAS INDUSTRY.

[Extracts from the Presidential Address of Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P., before the Junior Institution of Engineers at a meeting at the Royal Society of Arts, Adelphi, W.C., on Dec. 7.]

A general harnessing of the surplus gas from coke oven plants is desirable; and a national scheme of co-ordination in gas will show itself in the near future as being as desirable as is the linking-up of our generating systems for electricity, which is now being brought about. Long-distance transmission is a practical proposition to-day, and the near future, no doubt, will see gas being made at the pit-head, where the coal is treated, and being pumped through long-distance pipes, to be used locally wherever a load is found.

LOW-TEMPERATURE CARBONIZATION.

The low-temperature system of coal treatment has had an unfortunate business atmosphere to contend with for the last twenty years. Many early pioneer works have had an unfortunate city experience; a conspicuous example of this being wireless. They have, however, overcome the atmosphere of distrust, and have grown into flourishing industries; and such will be the case with low-temperature carbonization of coal. Treatment of this sort is, of course, applicable to all coking coals; but it has this great advantage—that the non-coking coals can be treated, in certain systems, even more easily than strongly coking coals. The coal is here, roughly, turned into three commodities, each of which is more marketable than the original fuel, the products being residual fuel, oil, and gas. The proportions of these vary enormously, according to the type of coal used, but representative figures on a ton of coal treated are 13 to 14 cwt. of residual fuel, 3000 c.ft. of gas of a B.Th.U. value of about 750, and 20 gallons of oil.

It will be noticed that I use the words "residual fuel" for lack of a better description of coal treated by a low-temperature distillation system. This is a new fuel, and its structure is very different from coke. Coke has a strong graphitic covering due to the oil cracking, which takes place around it at the temperatures involved in its manufacture, which, though a carbon deposit, makes it a difficult fuel to start burning. Residual fuel from low-temperature carbonization is of an entirely different type. Here, the structure of the coal is maintained in its original form. Its oil content has been extracted, and it has no graphitic covering. It has about 10 p.ct. of volatile matter, the rest being carbon and ash. This fuel is readily lit, will burn in an open fire lit by paper (not even demanding wood), and, unlike coke, will burn itself out. It must be appreciated that it is a new fuel, and will have to find its own corner in the industries of the country, which, due to its peculiarities, it can well do. In extracting oil from coal it is essential that the oil should not be cracked; and here one of the great difficulties arises in most forms of treatment, as oil from coal is one of the most valuable forms of crude oil that can be obtained. It contains about 15 p.ct. of most valuable lubricating oils; and when it is remembered that in this highly industrial country of ours 98 p.ct. of lubricating oil is imported from America, it will be realized that the production of lubricating oil from any home source, from a national point of view, is a very desirable thing.

If this valuable fraction in the extraction from coal is spoilt,

then the price of this oil must necessarily be lowered; and the whole aim of coal treatment is to make money by enhancing the value of the coal treated. It will be appreciated that the lack of cracking in the treatment of the oil is one of the most important points in this treatment. Provided that this is extracted in the correct way, it is found that oil from coal, from whatever seam and whatever character, is constant, and is a primary oil in the true sense.

There is not, at the present moment, a big business in distilling oils in this country; but should low-temperature oils be available in large quantities, a new industry may well spring up, where the valuable fractions are distilled and made ready for the market. The rough proportion of cuts in a true low-temperature oil on distillation are as follows:

	P.Ct. by Volume.
Petrol	7·5
Paraffin	1·5
Diesel oil	20
Lubricating oil	15
Phenols	30
Pitch	25

Since the advent of cracking this range can, of course, be altered according to the demand of the market, and the present tax of 4d. per gallon on the lighter oils may well make it worth while to crack up even the Diesel oils.

NEW SOLID FUEL.

It is, however, to be noted in this respect that, after all, oil is oil, and, whether it comes from California, Yorkshire, Leicester, or Burma, whoever uses it is only interested in whether it fulfils the actual purpose for which it is bought. On the solid side, however, we have an absolutely new fuel—neither coal nor coke, but a new production altogether—and it is by finding a market for this, and a demand such as to keep its price up to a certain level, that the success or failure of low-temperature distillation must depend. It is obvious that anybody dealing with this problem must give certain attention to this side, or his balance-sheet will show a debit.

OIL AS A HEATING UNIT.

Oil, as a heating unit, has been insidiously creeping into our domestic life in a way which few of us have appreciated. Twenty years ago the use of the oil stove as a cooking unit was quite a rare installation, but yet we find up and down the country to-day small oil stoves, with all their advantages, burning a product imported from America and affecting the health of our basic industry. This particular displacement of coal is liable to spread still further; such propositions as central heating with thermostatic control are spreading, added to which the most distressing disputes in the coal industry have accelerated the change-over from one fuel to another. Many of the results which were temporarily due to these disputes have become permanent. For instance, I know of a big organization in the West of England generating over 1000 H.P. by steam, which is being fired by oil imported from America, with a coal mine five miles away with a long list of unemployed at its doors.

EFFECT OF L.-T. CARBONIZATION ON COAL PRODUCTION.

It will be interesting to see how extensive low-temperature distillation would affect the amount of coal required in this country apart from export. Take the case of household fuel, which uses 22 p.ct. of the coal mined, or 40·32 million tons per year. Here, if we could provide, by a system of treatment, a fuel equal to any coal, but smokeless, we should be reducing every ton to, roughly, 13 cwt. This fuel may be burnt as straight residual fuel, or it may be briquetted; but it must be remembered that each ton is reduced to 13 cwt., the rest being taken out in gas and oil. Consequently, to supply the needs for household use we should require to mine no less than 60 millions to get 40 millions for household use, an increase of 20 million tons.

Gas production might come down, in view of the possibility of harnessing gas from coke ovens, and from treatment of coal; but this does not mean that gas *quâ* gas would be used any the less. Gas as a heating medium would always have its followers, as in many walks of life electricity can never compete with it. This has been shown with singular clearness in Chicago, where the great Edison Company, under the direction of Mr. Samuel Insull, took on the supply of gas to that town as well as electricity, and, though having a large increase in electricity consumption, has built up an enormous gas organization at the same time. It is a fundamental mistake to think that gas and electricity are rivals. They are children of the same parent, and are both required in modern industrial life.

It may indeed happen in some cases that coal from the mine is not used as coal at any stage, but that it be, first of all, treated by low-temperature carbonization, thus extracting the gas and heavy oils, and that the residual fuel be then built up synthetically into hydrocarbons. Here is an entirely new use for coal, such as has never been dreamt of; and it is for the brains and for the imagination of engineers to push these things to their natural finality. I do not pretend that our import bill of 40 million pounds for oil will be wiped out in a few years, but the drain upon the resources of industrial Europe, full of coal but lacking in oil, will eventually be stopped, and, consequently, in this great endeavour we find allied on our side both France and Germany, working at the same problem. So many of our industrialists, though recognizing that coal is the basis of our prosperity in this country, will writhe at the idea of investing a 1d. to try out any coal treatment process. If 100 million capital is wasted on unsuccessful efforts, and the 101st proved successful, that last million would well repay the hundred spent in investigation. The secrets of the economic success of coal treatment will not fall from the sky, but will only be revealed through the hard work, enterprise, and imagination of the engineers in this country.

SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).

Visit to the Union Works of the Scottish Tube Company, Ltd.

On Dec. 12 about fifty members of the Association visited the Union Works of the Scottish Tube Company, Ltd., at Coatbridge. They were met by Mr. James Crofts, Mr. Hamilton, and several other members of the firm.

The tour of inspection was arranged in order of manufacture, and tubes were seen at all stages of the process. Electric welding was an interesting feature. A demonstration of the methods of testing eliminated any doubt as to the sound condition of the tubes.

After the tour was completed, the visitors were entertained at tea in the works canteen.

Mr. CROFTS, in welcoming the guests, spoke of the aim of the Scottish Tube Company to produce tubes of the highest standard.

Mr. JOHN MURRAY, President of the Association, thanked Mr. Crofts, and asked him to convey to the Directors the warm appreciation of the members for the interesting visit and for the hospitality which had been shown. Tubes and pipes were a most important factor in gas supply; and he felt sure that all who had had the pleasure of inspecting the Union Works had derived no small benefit.

GEORGE WILSON GAS METERS, LTD.

Extension of Premises.

During 1928, Messrs. George Wilson Gas Meters, Ltd., enjoyed a period of great progress; and it became necessary for them to add an extra wing to the works, to cope with the increasing business. Now the firm are again faced with the necessity of further extensions to the buildings; and a start has been made with the erection of new machine shops. As soon as these are finished, the old machine shops will be occupied by the meter assembling departments.

Factors in this progress have been the "Certus" oiling and greasing device, high-capacity meters, and the "Duplex" attachment for changing 1s. slots to 1d. or 1d. slots to 1s. The London Works has had to be transferred to larger premises. The firm will again be showing at the British Industries Fair, Castle Bromwich, next February, and hopes to have models of interest to the gas profession.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Mr. Wilson's Criticism of Mr. Gilbert's Lecture.

SIR,—I was present at the lecture before the London and Southern District Junior Gas Association, and I must say that I was struck by the very fair manner in which the lecturer dealt with a difficult subject, without giving undue prominence to any particular person or firm. Mr. Gilbert's reply to Mr. Liberty also brought this out plainly.

I therefore must say that I consider the comments made by Mr. Wilson (see "JOURNAL" for Dec. 26, p. 861) entirely unwarranted. Where a range of 123 years is reviewed, surely "10 or 20 years" is recent history, within the memory of most of us.

We are well aware that meter makers produced small gas fire meters, and that the 1920 Gas Regulation Act brought a shoal of therm registering indexes; but had Mr. Gilbert mentioned all the abandoned ideas, he would have needed a week of such lectures. But as a practical summary of the history of meters it was a great achievement, and I congratulate him upon it.

R. WEST.

53, *Russell Road,*
Holloway, N. 7,
Dec. 31, 1928.

REGISTER OF PATENTS.

Gas Production.—No. 288,336.

SCHWEDER, W., of Magdeburg.

No. 10,396; April 5, 1928. Convention date, April 6, 1927.

In the process of producing a mixture of coal gas and water gas, the patentee proposes to combine the steps of transferring glowing coke from a coal gas retort or coke oven to a water gas generator, introducing steam into this generator for producing the water gas, injecting air into the water gas generator when the initial heat of the coke is no longer sufficient for the production of water gas, and using combustion gases due to the air blast for preheating fuel gas used for heating the retort or oven, and/or for raising steam for the water gas generator.

Gas Generators.—No. 294,523.

HUMPHREYS & GLASGOW, LTD., of Victoria Street, S.W. 1 (Assignees of BATTIN, W. I., of Philadelphia, and CHRISMAN, C. S., of West Chester, U.S.A.).

No. 10,700; April 11, 1928. Convention date, July 25, 1927.

According to this invention a gas generator is provided in which there is interposed between the fuel bed and the jacket wall a facing which is metallic, or the lower portion of which is metallic, and presents a permanently smooth surface for the unimpeded descent of the ignited column of fuel. Such a facing is preferably easily replaceable, and may comprise loosely arranged or fitted blocks (or plates) which will reduce the flow of heat from the fire to the metal wall of the cooling jacket and also protect the wall of the cooling jacket from wear. At the same time, by contact with the jacket, the facing itself is kept sufficiently cool to prevent its destruction by the fire. The facing may be such as to provide air spaces or joints so as to reduce further the flow of heat.

Meters.—No. 300,599.

SIMPSON, S., of Exmouth.

No. 21,527; Aug. 16, 1927. No. 14,384; May 16, 1928.

This invention relates to gas meters of the rotary or blower type in which two intermeshing elements are rotated in a casing by the pressure of the gas or air, and are so connected to a counter that the quantity of gas passed is registered. The invention has for an especial object to provide a meter in which the friction of the rotating elements is reduced to a minimum (with a consequent reduction of back pressure) and in which the inlet and outlet connections are conveniently arranged.

A casing is provided comprising three superposed chambers, the middle of which is adapted to receive the rotating elements with the shafts vertically disposed, and the upper and lower chambers of which respectively receive the ends of the shafts and serve for gearing connecting the shafts and for the support of the shafts in ball or roller bearings. The lower chamber, which is advantageously formed in a bedplate upon which the main chamber is carried, is provided open at the bottom for the reception of a cover plate by which footstep bearings for the shafts are supported. Inspection openings having removable cover plates may be provided either in the cover plate or in the wall of the bedplate.

According to the invention, moreover, the inlet and outlet to the casing are disposed respectively on opposite sides thereof, and are advantageously provided as projections or extensions laterally disposed with respect to the casing and of cross-sectional area increasing from upper to lower end. The inlet and outlet passages lead to openings in the underside of the bedplate.

Retort Settings.—No. 301,361.

LOW-TEMPERATURE CARBONISATION, LTD., of Clement's Inn, W. C. 2, and PARKER, C. H., of Codsall.

No. 30,844; May 27, 1927. (Divided out of No. 299,795.)

This invention relates to a particular feature of the type of low-temperature setting covered by patent No. 299,795, which was referred to in the "JOURNAL," Vol. 184, p. 743.

The main claim of the present specification is as follows: Settings for retorts for the distillation of solid carbonaceous substances, wherein combustion chambers are provided each consisting of a vertically disposed massive central wall and two parallel lateral walls disposed one on each side of the central wall, so as to leave on each side of the central wall a space extending the length of the combustion chamber within which combustion of heating gases is effected, and to separate the heating chambers, in which are disposed the retorts, from the combustion chamber.

Meters.—No. 301,661.

SMITH METERS, LTD., and SMITH, E. W., both of Kennington Park Road, S.E. 11.

No. 403; Jan. 5, 1928.

This invention refers to prepayment mechanism for gas or electricity meters of the kind wherein a coin table or coin-supporting lever, pivoted eccentrically with respect to the usual operating handle and quantity wheel but rotatable with the handle, couples the said handle and wheel together upon the insertion of a coin. It is sometimes found that the operation of "pumping," to obtain gas fraudulently, is performed—that is to say, a coin is inserted and the handle is turned forwards and backwards but is not turned far enough forwards to permit the coin to drop into the money box.

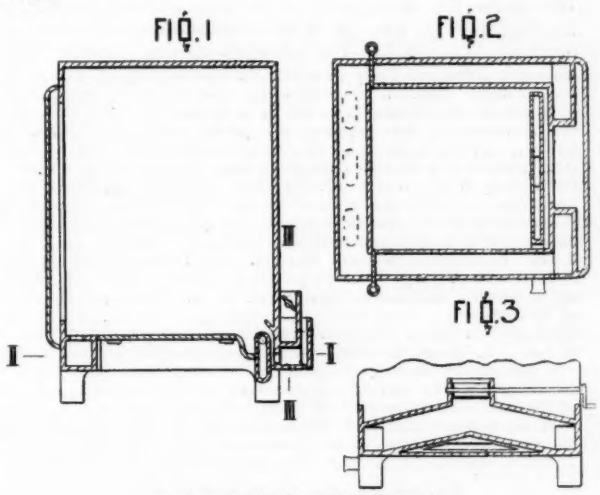
The primary object of the present invention is to prevent this movement; and accordingly the mechanism is provided with a non-return device or means coupled with the coin table or coin-supporting lever so that the movement of the same about its pivot due to the insertion of a coin is utilized to render the non-return device operative as such while the coin is on the table or lever.

Ovens.—No. 301,681.

SCOTT, F. S., of Christchurch, N.Z.

No. 6743; March 3, 1928.

The object of this invention is to provide an improved gas oven of such a character that the waste gases therefrom are caused to traverse the interior thoroughly before escaping to the atmosphere, and that the air supplied to the burner to support combustion is preheated.



An Oven Design from New Zealand.

The invention consists in the provision, in a gas oven having a door at the front and a gas burner arranged in the rear lower corner, of one or more outlet openings for waste gases arranged adjacent to the inner side of the front of the oven at a level beneath the door opening, and one or more substantially horizontal passages at the bottom of the oven communicating between the outlet openings and a vent-pipe at the rear of the oven. Further, there is provided a jacket-space in conjunction with the portion of the vent-pipe connecting with the horizontal passage or passages; and this forms a means of communication between the exterior atmosphere and a portion of the interior of the latter adjacent to the burner.

The arrangement is such that the heated gases rising from the burner become slightly cooled on reaching the top thereof, and in consequence pass downward again at the front of the oven and enter the outlet openings, whence such gases are delivered by the horizontal passages to the vent-pipe. This withdrawal of the gases serves to induce an in-flow of air through the jacket-space to the burner; such incoming air being heated in passing through the jacket-space.

Fig. 1 is a sectional elevation illustrating one embodiment of the invention. Fig. 2 is a plan on the line II—II, fig. 1; the positions of the outlet openings being indicated in dotted lines. Fig. 3 is a sectional elevation on line III—III, fig. 1.

Various modifications are described and illustrated.

Gas Production.—No. 300,767.

DESSAUER VERTIKAL-OFEN G.M.B.H., and BUEB, W., both of Berlin-Wilmersdorf.

No. 28,234; Oct. 24, 1927.

The patentees remark that the usual process of producing water gas by injecting steam (after coal gas has been produced) into the retort charged with coke, has two defects. In the first place the amount of water gas is small compared with the amount of coal gas; the production of water gas by introducing steam not being started till all the coal gas has been got from the coal. This is a material defect, because occasions arise when it may be necessary to produce water gas at a higher rate than coal gas. In the second place, they say, the coke used for producing the water gas by this process is generally more or less high-grade coke, in large lumps, which could economically be used for other purposes. Gas-works, however, frequently have low-grade fuel available, which can be coked and converted into water gas; and when coke is taken from the retorts after making coal gas, and is prepared for the market, there is generally a residue of slack, which is too small to find a ready market.

The claims show that the patentees' process of generating a mixture of coal gas and of water gas produced from low-grade fuel consists in externally heating two chambers, one containing coal and the other containing the low-grade fuel, passing the coal gas distilled from the coal through the low-grade fuel, and introducing steam into the coal chamber and passing it through the low-grade fuel when the latter has become red hot. Alternatively they may use a single externally heated retort charged with coal at the lower part and with low-grade fuel at the upper part.

MISCELLANEOUS NEWS.

THE EXPLOSION IN BLOOMSBURY.

Home Office Inquiry.

The Commissioners appointed by the Home Secretary to inquire into the circumstances of the explosion which occurred in the Bloomsbury district of London on the morning of Thursday, Dec. 20, as the result of which some gas mains were broken (see "JOURNAL" for Dec. 26, p. 844), commenced their inquiry at the County Hall, Westminster (the Headquarters of the London County Council), on Monday. It is the intention of the Commissioners to sit daily until the inquiry is completed. The indications are that a number of controversial points are likely to arise, and that the inquiry will occupy several days. Apart from those whose evidence is necessary to enable the Commissioners to arrive at a decision as to the cause of the accident—as, for instance, the public utility companies, the G.P.O., and the local authorities—traders and others who have suffered serious loss through damage to their property or by reason of the closing of the streets affected have, naturally, appointed representatives to watch the proceedings on their behalf. Though the Commissioners have not to deal with the question of legal responsibility, their findings must, of course, have a vital bearing upon it.

The Commissioners are Mr. R. G. Hetherington, O.B.E., M.Inst.C.E. (Deputy Chief Engineering Inspector under the Ministry of Health, Chairman); Lieut.-Col. R. A. Thomas, C.B.E. (one of His Majesty's Inspectors of Explosives, and a member of the Explosives in Mines Research Committee); and Mr. E. H. Tabor, M.Inst.C.E. (Assistant Chief Engineer of the London County Council).

A preliminary meeting was held on Saturday, Dec. 29, in order to discuss procedure; and among the many present one noticed several of the chief officials of the Gas Light and Coke Company.

At the commencement of the proceedings, the CHAIRMAN expressed the regret and sympathy of the Commissioners at the death of Mr. P. Thrower, the G.P.O. worker who was injured in the explosion.

NO CONCERN WITH LEGAL RESPONSIBILITY.

It was made clear by the Chairman that the Commissioners have nothing to do with any question of legal responsibility for what has occurred; their business is to endeavour to ascertain the actual course of events, and then to see what can be done to minimize the risk of a repetition of such occurrences, and to devise safeguards for life and property.

The parties who appeared at the inquiry were the Gas Light and Coke Company, represented by Mr. A. T. MILLER, K.C., and the Hon. CYRIL ASQUITH; the Postmaster-General; the Holborn Borough Council; the London County Council; the Charing Cross Electricity Supply Company, Ltd.; the Metropolitan Electric Supply Company, Ltd.; the London Power Company, Ltd.; the London Hydraulic Power Company; the Minister of Transport; the Electricity Commissioners; Sir Alfred Butt, the United Producing Corporations, and others interested in the play "Funny Face" at the Princes Theatre; some members of the National Caterers' Protection Society; and Mr. Carlo Ricaldone, the owner of the "Star and Garter" Restaurant, High Street, Bloomsbury. Some of these, including the Ministry of Transport and the Electricity Commissioners, were merely watching the proceedings.

The sequence in which evidence will be heard was discussed; and it was stated by the Commissioners that they would hear first the evidence of a number of eye-witnesses of the occurrence, whose names had been furnished by the police. It was intimated also that at some stage of the inquiry they hoped to have evidence from Prof. R. V. Wheeler (Director of Research, Department of Mines).

Mr. A. T. MILLER, K.C., in the course of discussion, said that the Gas Light and Coke Company would do their best to help the Commissioners to get at the facts. The Post Office, he pointed out, had first knowledge of what had taken place, because the trouble had occurred in a Post Office tube, to which they had full access, and, therefore, primarily they were in a position to assist the inquiry in a greater measure than were the Gas Company in getting at the facts.

The CHAIRMAN said that the Commissioners had inspected some of the sewers and the surfaces of several streets.

Mr. LIONEL WALFORD (Town Clerk, Holborn) emphasized that ultimately the question of liability must depend upon the Commissioners' findings. The roads affected would have to be re-laid in their entirety, and meanwhile the tradespeople were suffering untold loss as the result of the closing of the roads. There would be some question as to whether in future the pipes and mains should be laid in the same way as previously, or whether they should be laid in subways; and the question of how such occurrences could be avoided in the future was bound up with the problem of the re-laying of the pipes and mains. Therefore he urged the desirability of arriving at a decision on these matters as early as possible, so that the Borough Council and the people in the district might know where they stood.

The CHAIRMAN assured Mr. Walford that the Commissioners would do everything they could to expedite matters.

Mr. HAROLD MURPHY (for the Postmaster-General) said he was in almost entire agreement with Mr. Miller, except, perhaps, on the question as to where the explosion occurred. He did not want it to be assumed at this stage that it had occurred in the Post Office tube.

Mr. MILLER, replying to the Chairman, said that the Gas Company were prepared to give evidence immediately after evidence had been given by the eye-witnesses, if the Commissioners so desired; but he thought it would be better for the Post Office to lead off.

Mr. MURPHY said that, as the explosion was a gas explosion, he would have anticipated that the case for the Gas Company would have been put first.

Mr. MILLER, while agreeing that it was a gas explosion, said it was not at all clear that the gas which exploded had come from the Company's pipes or mains. The Company regarded the question of the ventilation of the tube where the explosion occurred as being of primary importance, and probably of over-riding importance, in arriving at the cause of the explosion.

The CHAIRMAN said he assumed the Post Office would give evidence on this.

Mr. MILLER added that, in connection with this problem of ventilation of this exceptional tube, there had been a large body of correspondence, extending over years, between the Gas Company and the Post Office. It seemed to him that what had been said to the Post Office with regard to ventilation was of the utmost importance.

The CHAIRMAN agreed that this would be pertinent.

Mr. MILLER said the Commissioners might think it advisable subsequently to consider the position of all authorities and undertakings entrusted with powers under which they had traps or boxes let down into the subsoil. If so, he would say that most authorities were under statutory obligation to provide ventilation, and so far as he knew the Post Office was not under similar obligation. This had a bearing upon the important question of how far the Post Office could be in line with the best and most desirable methods to be adopted for keeping these places properly ventilated and free from gas.

It was agreed that, after the evidence of eye-witnesses had been taken, evidence would be given by the Gas Light and Coke Company, the Post Office, the Holborn Borough Council, and the London County Council, in that order, as to the position of the mains and works in the streets affected.

Discussion ensued as to the desirability of the interested parties inspecting the subways, sewers, &c.; and arrangements were made for them to carry out the inspection on Sunday morning, Dec. 30.

Monday, Dec. 31.

On Monday, evidence was given by Police Officers and other eye-witnesses of the explosions. The streets affected were High Street, Broad Street, and High Holborn, which form a semi-circular length of roadway south of Oxford Street, leaving the latter at St. Giles' Circus (the junction of Charing Cross Road, Oxford Street, and Tottenham Court Road) and rejoining it about half-a-mile eastwards, at a point a few yards west of Kingsway.

The Postmaster-General was represented at the inquiry by the ATTORNEY-GENERAL (Sir Thomas Inskip, K.C.).

Sub-Divisional Inspector *Hemphrey* (Metropolitan Police) described the occurrences. An explosion occurred, he said, just after 8 o'clock on the morning of Dec. 20. It appeared to have commenced under the roadway near a manhole at the rear of the West Central District Post Office (in High Holborn), and the roadway was disturbed along Broad Street and High Street as far west as St. Giles' Circus, and in an easterly direction to a point west of Kingsway. In some cases the surface was badly cracked, and in others it was blown right out. The course of the explosion followed the lay of the gas mains. In High Holborn the earth in places had fallen away, leaving cavities covered only by a crust of concrete and wood. It had burned for about two hours, and gas was flaming from various fissures in the road. At 12.20 p.m., as the result of further explosions, a five-storey building, 28, Denmark Street, occupied by a firm concerned with films, had taken fire and was burned out. Owing to the danger from gas, &c., residents in High Street were advised to move, and this they had done. On Dec. 22, the danger was declared to be at an end. Nine people had received injuries, and five others were affected by gas. One man had since died, but the remainder were progressing favourably. The injuries consisted generally of cuts, bruises, and shock. A taxi-cab had been overturned, and the driver injured. Temporary gas and water services had been improvised. The Princes Theatre had been closed until the afternoon of Dec. 26.

Questioned by Mr. A. T. MILLER, K.C. (for the Gas Light and Coke Company), witness said he had compiled his statement from information he had received.

Mr. MILLER suggested that the picture given by witness was a little inaccurate in one respect; and he asked if witness was familiar with the course of the Post Office pneumatic tube.

Witness replied that he was not, and that his statement was based on what he had seen of the results of the explosion.

Mr. MILLER asked if the tube referred to did not follow the course of the explosions.

Witness replied that he did not know.

The CHAIRMAN: I think we must take it that it follows that line.

The ATTORNEY-GENERAL said there would be no question as to the course of the subway or the gas mains; it was a matter for proof by the two authorities concerned.

Replying to further questions, witness agreed that the Gas Company's men had arrived on the scene promptly, had worked efficiently, and had done everything possible.

Replying to Mr. LIONEL WALFORD (Town Clerk, Holborn), Police-Sergeant *Betts*, who was on duty near High Street just after 8 o'clock, said that the flames had the appearance of ordinary flames from a gas jet, and there was not a lot of smoke. He had noticed a strong smell of gas when he had first reached the High Street, and it persisted the whole time up to 3 o'clock, when he went off duty.

Replying to the ATTORNEY-GENERAL, he said he had not noticed a smell of gas before the explosion. The ground continued to heave after the rumbling had faded away.

Police-Constable *Ledger* said that when he heard the explosion he ran into Broad Street, and saw a manhole cover which had been blown out. He saw the road open and fall in again, and flames came out of the hole. He saw Mr. Thrower, the G.P.O. worker who had since died, being helped away from the manhole. An air pump which had been standing at the top of the manhole had been blown over, and was resting on the manhole cover about three yards from the hole. A piece of piping, about 4 in. in diameter, was attached to the pump, and the spare end of it was smouldering. There was no smell of gas at the manhole. He had taken Thrower to Charing Cross Hospital, where the latter had stated, "I went down the hole to connect up the pipe with the air pump, and before I knew what was the matter I was blown out of the hole again."

Replying to Mr. WALFORD, witness said that Thrower's clothes were not burning, but were charred.

Police-Constable *Walder* mentioned two manhole covers which had been blown about 30 ft. into the air at the junction of High Holborn and Kingsway.

The CHAIRMAN said he understood that both these covers were on the chamber which formed the terminus of the Post Office tube.

Replying to questions, witness said he had seen another cover lying beside a hole. He had seen no flame. He had remained near the manholes for about a quarter of an hour, and had noticed no smell of coal gas.

Mr. *F. J. Garrod* (ironmongers' assistant) said that when walking down High Street he had heard a terrific explosion, and the pavement had given way two or three seconds afterwards, throwing him to the ground.

In reply to the CHAIRMAN, he said he had seen no flame or smoke, and had smelt no gas whatever.

Mr. *E. A. Cox* (a fitter) stated that he was walking within 20 or 30 yards of the manhole to the Post Office tube when he saw a man climbing out of it. At that moment there was a very great rumbling underneath, and a blue and then a red flame came from the manhole, and there followed an explosion. He was thrown on to his back, and débris and mud fell on him and around him.

Replying to Mr. MILLER, he said the flame at first was a blue curling flame, and later it was red.

Answering Lieut.-Col. THOMAS (one of the Commissioners), he said that the rumbling and the emission of the flame were practically instantaneous.

Mrs. *Louisa Jones*, who was in High Street, said that she heard a roar and an explosion, which threw her across the road. She saw no flame, but there was a mass of cloudy smoke, having the appearance of a thick fog.

Mr. *J. Standley* (a Post Office labourer who was at the manhole at the time of the explosion) was examined by the ATTORNEY-GENERAL. He and Mr. Fisher (his senior) had found the manhole cover rather tight, and it had taken them some minutes to open it with a chisel. Thrower arrived with an air pump just when the manhole cover was removed. Shortly afterwards he descended into the manhole with the lead from the air pump (which lead consisted of an electric cable with a three-pronged plug at the end), in order to insert the plug into the necessary fitting. Witness remained at the top of the manhole, and played out the lead to Thrower, who subsequently informed him that he had enough lead. Witness saw Thrower pass out of the manhole into the tube; and as Thrower went out of sight into the tube, witness heard a "bit of a boom" and flame came into the manhole, at the same height as the top of the tube. The flame did not come out of the manhole, but was drawn back into the tube. Thrower reappeared at the bottom of the manhole, and witness heard a sort of thud, which appeared to be some distance away. He estimated that it was near the Princes Theatre. Thrower started to climb the ladder out of the manhole, but when his head and shoulders were out of the hole the flame caught him; witness helped to pull him away. The flame was blue and red, like the flame from a blow lamp.

Replying to the ATTORNEY-GENERAL, witness said that he and his companions had not been smoking, and had not used lighted lamps, candles, or matches. As soon as he began to clear the holes of the manhole cover in order to insert the keys for lifting the cover, he had smelt gas, which he thought was coal gas.

Questioned by Mr. MILLER, witness said he had been employed by the Post Office only twelve days at the time of the occurrence. There was no smell in the street before he had arrived at the manhole. While he was working at the manhole, the smell of gas was strong; and he had mentioned it to Thrower, who replied, "We have had it worse than this."

Replying to further questions by Mr. MILLER, witness said that the safety book issued to Post Office workers contained instructions that when the men smelt gas they should lower a safety lamp; and he admitted that that was not done.

Mr. MILLER: You took no precautions to ascertain whether or not there was gas still in the tube?—No.

You did not go to an adjoining manhole or do anything which would let in any special ventilation to this closed space?—No.

The flame which came into the chamber to which the manhole gave access seemed to come from the tube on both sides of the chamber. The chamber was about 8 ft. or 9 ft. deep, and the flame covered the bottom of the chamber to a height of about 4 ft., which was the height of the tube. The flame seemed to be drawn back again along the tube. After the flame there was a deafening explosion.

Replying to Mr. WALFORD, witness said he believed the switch into which the lead from the air pump fitted was inside the tube, and it was dark in there. Thrower could not have had time to attach the cable to the switch before the explosion occurred.

The CHAIRMAN remarked that he had seen the sockets into which the plugs fitted. A small metal attachment had to be unscrewed before the plugs could be inserted, so that a little time would be occupied in unscrewing this before the plugs could be inserted.

Further evidence from eye-witnesses was given, but this added

OPENING OF THE HOME OFFICE INQUIRY.

nothing to what had been stated by the previous witnesses so far as the general features of what took place are concerned. One important point was brought out, however. Several of these witnesses were employees in the neighbourhood; and they had actually walked almost the whole length of the road above the Post Office subway from the Holborn Restaurant to High Street on their way to work a few minutes before the explosion took place. Mr. Miller, for the Gas Light and Coke Company, asked all of them the question whether during their journey they had noticed any smell which they could ascribe to a leakage of gas, and in every case the answer was an emphatic "No." One witness employed opposite the Princes Theatre added that, though gas was being used for cooking and lighting at the time of the explosions, there was no interruption of supply until the request came from the police to turn off all gas taps.

Examined by the ATTORNEY-GENERAL, Mr. *William Charles Fisher*, a skilled worker, Class II., in the employ of the Post Office, who was working with Thrower and the previous witness, Standley, at the time of the explosion, told much the same story of the preliminaries to starting work at the manhole outside the West Central Post Office in Broad Street as had been related by Standley. Speaking of the removal of the manhole cover, he stated that he did not smell coal gas when clearing the keyholes prior to inserting the keys for lifting the cover, and added that if Standley called his attention to a smell of coal gas he did not hear him. He had no recollection of any such remark being made. At the same time, when the cover was removed he noticed a familiar smell coming from the manhole, just as was always the case when manhole covers were removed. This disappeared, however, in about ten minutes. The explosion occurred when he was walking towards a scavenger's barrow to throw away some used carbide from an acetylene lamp, but he saw no flame, sparks, or smoke. Seeing that Thrower was being attended to, he ran away towards Drury Lane, giving the alarm. He confirmed what Standley had previously said—viz., that there was no smoking on the part of the three men at the time of the explosion, nor had there been previously to it.

Speaking of a visit of inspection paid to the Post Office tube in November, 1926, by himself and Levitt, his superior, witness said that they used open acetylene lamps, but when some distance inside the tube they were both overcome; and while, on the instructions of Levitt, he himself got out of the tube, Levitt had to be rescued, and both were taken to University Hospital.

Asked to describe the nature of the smell which he had said always existed in this tube, witness said it was a "nasty smell," something which might be described as "sewery," or even sewer gas.

Mr. MILLER cross-examined witness, on behalf of the Gas Light and Coke Company, for over an hour; and it will be convenient to crystallize some of the questions and answers into a connected story.

From this cross-examination it emerged that when Post Office workers leave the tube they seal all manholes so that they are air and gas tight. In the same way, where, at the ends of the tube, the cables are run into small conduits, the ends of the conduits—whether occupied by cables or not—are puttied round, so that the small conduits themselves are rendered air and gas tight in a similar manner. Further, the iron segments composing the tube are caulked with lead. Witness agreed with Mr. Miller that when Post Office workers leave the tube it is, for all practical purposes, air and gas tight.

Mr. MILLER further cross-examined witness, and was told that on the occasion when he last worked in the tube five weeks before Dec. 20, there was the same familiar smell to which he had referred. This smell, he added, varied according to the weather. It gave him pains in the head, made him feel giddy, and made his eyes smart.

Mr. MILLER: Have you any instructions what to do in the event of a smell of gas?—Yes.

What are those instructions?—To put a safety lamp down the manhole.

You did not apply that instruction on this occasion?—No.

You carried out no test whatever?—No.

Did you take any steps to see if there was a smell of gas coming through the keyhole.—No.

Did you smell anything yourself?—No, nothing at all.

Supposing you had smelt gas, would you have done anything?—I should if I had smelt coal gas.

Did Standley say anything at all to you at that time about gas?—If he did, I did not hear him.

When did you first smell anything from the tube on this occasion?—When the cover was lifted.

In the course of further answers, witness was emphatic that Thrower did not take a light with him into the tube; and when Mr. Miller suggested that he might have struck a match to see where the power plug was, witness said the explosion followed too quickly upon Thrower's entering the tube for him to have done that.

Mr. WALFORD referred to the suggestion that sewer gas might have been present in the tube.

Witness replied that he did not suggest that sewer gas was present, but that the smell was a "sewery" smell.

Mr. WALFORD then asked if it were possible for a spark to have occurred when the plug was placed in the power socket.

Witness said he did not think so.

Questioned about the occurrence in the tube in November, 1926, when Levitt and witness were overcome, witness said he made a report with regard to this, and it was as a result of that report that the machine was used for ventilating.

In reply to the CHAIRMAN, witness said it was impossible for the trouble in November, 1926, to have been caused by coal gas, as Levitt and himself were carrying open acetylene lamps, and there would certainly have been an explosion.

Mr. MILLER informed the Tribunal that there had been considerable correspondence between the Gas Company and the Post Office concerning the November, 1926, affair, and the Post Office had been satisfied that it was not due to coal gas.

The inquiry was then adjourned until Tuesday morning (Jan. 1).

CHIEF GAS ENGINEER FOR MANCHESTER.

Gas Committee's Decision.

The report of Mr. F. O. Stanford, the Engineering Inspector of the Ministry of Health, on the causes of the accident which occurred in August, 1927, at the Bradford Road Gas-Works, was formally considered on Dec. 21 by the Manchester Gas Committee; and at the close of the meeting the publication was authorized of the Committee's observations on the report, which during the last few months have frequently been demanded at the Council meetings.

In view of the opinion of the Inspector that the Corporation were incurring a serious risk in working the holders in question, and that this responsibility rested directly on the Gas Committee in the absence of a chief engineer directly responsible to them, the most interesting point in the Committee's commentary is the decision to recommend at an early date the appointment of a responsible chief engineer. The Committee state that this decision is in accordance with a policy they had previously decided upon, and that they refuse to accept the suggestion of the Inspector that the responsibility for the accident rested with them, on the ground that at the time of the accident there was an experienced and capable engineer directly responsible to the Committee for the working and maintenance of the works plant.

GAS REGULATION ACT APPLICATIONS.

SPECIAL ORDERS.

Andover Lighting and Power Company.

To enable the Company to utilize scheduled lands for gas purposes, and to issue preference stock.

Bury St. Edmunds Gas Company.

To extend the limits of supply, to provide for the conversion and consolidation of capital, and for other purposes.

Cleveland Gas Company.

To empower the Company to acquire a portion of the undertaking of the Brotton Gas Light and Coke Company, Ltd., to establish a thermal basis of charge, and to make various regulations governing the supply of gas.

Hertford Gas Light Company.

To change the name of the Company, to define the limits of supply, to provide for the conversion and increase of capital, and to make general provisions.

DECLARATIONS OF CALORIFIC VALUE.

Farnham Gas and Electricity Company.—500 B.Th.U. (March 25, 1929.)

Hinckley Urban District Council.—475 B.Th.U. (June 20.)

SENSIBLE HEAT DISTILLATION, LTD.

On Dec. 18, the Managing Director of Sensible Heat Distillation, Ltd., Mr. Bryan Laing, sent to the shareholders a letter indicative of the present position and prospects of the Company, and outlining the immediate policy. In this it is stated that a Parent Company to handle the "L & N" rights is in course of incorporation in New Zealand; one of the Directors being Dr. Prendergast Knight, who is a Director of the Wellington Gas Company, Ltd. It is mentioned also that tentative arrangements have been entered into to combine the existing 100-ton unit erected in India into a Company which is to acquire the patent rights for India.

The first commercial unit of the "L & N" process was erected at the New Lount Colliery, Ashby-de-la-Zouch, Leicestershire. As a result of the experience gained from the operation of this plant, the Leicestershire Colliery and Pipe Company are desirous of having four other "L & N" units erected forthwith. They have also stated that they consider the amalgamation of the Colliery Company, the Pipe Works, and the Leicester ("L & N") Coal Distillation, Ltd. (who are the owners of the existing "L & N" plant), into one Company would be a desirable operation. Four other units are to be erected by the Company. It is proposed, therefore, to increase the capital of the Leicester ("L & N") Coal Distillation, Ltd., in the immediate future.

Negotiations are well advanced for the formation of a Company for the Forest of Dean, which has for its object the development of a colliery and the erection of an "L & N" unit. In Tasmania, "L & N" Brown Coal, Ltd., is to receive £50,000 debentures (part of £100,000, a 7½ p.ct. convertible debenture) for the purchase and erection of a complete distillation plant at the works now existing in Tasmania, to distil a minimum of 100 tons of shale per day. This plant is now being constructed, and will be shipped immediately on completion. Negotiations are also taking place with a view to forming a Company to acquire the Joadga shalefield, New South Wales: and an "L & N" plant capable of distilling 125 tons per day has been ordered, is being constructed, and will be shipped immediately on completion. Discussions have been entered into with the Colliery Company at Lal Lal, Victoria, for the purchase of a 100-ton unit of "L & N" plant. This plant has been ordered, and will be shipped on completion.

CONTRACTS OPEN.

Gasholder.

The Walsall Gas Department invite tenders for the supply and erection of a four-lift spiral gasholder. [See advert. on p. 57.]

GAS PROGRESS IN SHEFFIELD.

An Industrial Supplement published by the "Sheffield Daily Telegraph" on Dec. 31 contained some interesting notes on the progress of the gas industry, with special reference to the local Company.

The aim and object of the Sheffield Gas Company, it stated, is to supply gas at a cheap price, and they would direct the attention of the public to the three new branch showrooms opened recently, where up-to-date appliances could be viewed. Cookery demonstrations are given at the chief showrooms twice a week. Since the publication of the last Industrial Supplement the price of gas has been still further reduced, and the Company now supply gas at the price of 1s. per 1000 c.ft. to large industrial consumers.

FURNACE DEMONSTRATION ROOM.

Manufacturers interested in the use of gas as an industrial fuel are invited by the Sheffield Gas Company to make use of their furnace demonstration room at Shude Hill, and to try out and solve their heating problems, whether they propose to buy a new furnace or not. The furnace room has been constructed solely for the use of Sheffield manufacturers, and the Gas Company earnestly hope that they will take advantage of the opportunities provided for fully testing any type of gas-fired furnaces under actual working conditions for suitability and efficiency before making any alterations to their existing furnace equipment.

In order to be prepared for the increased demand for gas which is sure to follow the generally anticipated improvement in the trade of the city, the Sheffield Gas Company, with their usual enterprise, have recently modernized the furnace demonstration room. This room is now replete with all the necessary equipment, including gas and air compressors, sperm oil, brine, water tanks, pressure gauges, pyrometers, &c., for carrying out and accurately observing any desired conditions of test. A number of modern furnaces specially designed to suit Sheffield trades are fixed and available for immediate use. The gas consumption for any furnace can be readily and accurately measured.

The industrial furnace room is in charge of a qualified representative, and the staff are specially trained to render advice and service to industrial consumers.

Many Sheffield manufacturers are now using gas for large heating operations, such as re-heating blooms, slabs, billets for forging and rolling, &c., where formerly solid fuel was used exclusively, and from actual experience have found it to be not only superior in every way to any other fuel, but actually cheaper when all costs are taken into consideration. It may be mentioned incidentally that these firms are also doing their part to reduce the amount of dirt, smoke, and soot which contaminate the atmosphere of the city, by shutting down crude solid fuel furnaces, and making use of the modern smokeless method of heating. In this way they are helping to remove one of the most unpleasant features of industrialism.

For power purposes the Company employ a special representative who is an expert on the subject, and whose business it is to call periodically upon all gas engine users, with a view to seeing that they are satisfied with their power plant, and that everything is working correctly. The Sheffield Gas Company also undertake the inspection of engines in the interest of consumers, and undertake any light repairs which are entrusted to them.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Dec.* 31.

Tar products generally continue quiet.

Pitch is unchanged at about 40s. per ton.

Creosote is about 7d. per gallon.

Tar spirits are in good demand; pure benzole being 1s. 9d. to 1s. 10d. per gallon; pure toluole, 2s. 1d. to 2s. 2d. per gallon; and 95/160 solvent naphtha, 1s. 6½d. to 1s. 7d. per gallon.

Pyridine is about 4s. 3d. to 4s. 6d. per gallon.

Tar Products in the Provinces.

Dec. 31.

Owing to the holidays there is nothing to report in the market for tar products.

The average prices of gas-works products during the week were: Gas-works tar, 23s. 6d. to 28s. 6d. Pitch—East Coast, 35s. to 36s. f.o.b. West Coast—Manchester, 30s. to 30s. 6d.; Liverpool, 32s. to 33s.; Clyde, 32s. to 33s. Toluole, naked, North, 1s. 5d. to 1s. 6d. nominal. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 1½d. to 1s. 2d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid, 4⅜d. to 5d.; salty, 4⅝d. to 4⅞d.; Scotland, 4⅝d. to 4¾d. Heavy oils, in bulk, North, 8½d. to 8⅝d. Carbolic acid, 60 p.ct., 1s. 11d. to 2s. prompt. Naphthalene, £13 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

Benzole Prices.

The following are considered to be the market prices to-day:

	s. d.		s. d.	
Crude benzole . . .	0 10	to	0 10½	per gallon at works
Motor ,, . . .	1 4	,,	1 4½	,, ,, ,,
90 p.ct. ,, . . .	1 7	,,	1 8	,, ,, ,,
Pure ,, . . .	1 10	,,	1 11	,, ,, ,,

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

There has been very little doing during the past week, and the present week will again be broken by the New Year holiday, when the pits are all idle. Prospects for January are regarded favourably, and, if supplies of tonnage are adequate, a full month is anticipated. At this time of the year shipping is always liable to be upset by weather conditions, and, with boats scarce in any case, as they are at present, any delay is bound to cause weak positions among the collieries.

On the whole, the tone is very steady, and prices are maintained. Northumberland steams are well sold. In the Durham section, gas makes are fairly firm, but, generally speaking, could do with more trade. Coking coals are slow. Good bunker qualities are in demand, but seconds are still in ample supply.

Wear Special gas coals are quoted at 15s. to 15s. 3d. f.o.b., and best qualities 14s. 9d. Seconds are 13s. 3d. to 13s. 6d. Durham coking is 13s. to 13s. 6d. Best Durham unscreened steam is firm up to 14s. 3d.; seconds are 13s. to 13s. 3d. Best Northumberland screened makes ask up to 14s. 6d., and others from 13s. 6d. to 13s. 9d.

Gas coke is quiet, and is quoted at 18s. 6d. to 19s. f.o.b. for shipment.

YORKSHIRE AND LANCASHIRE.

The markets are easy, and industrial coal appears to have settled by reason of the fixing of contracts to commence this week. Recent values have been maintained.

The demand for domestic coal has been moderate during the past week, and orders have been executed with promptness.

MIDLANDS.

The holiday interruption has affected the market equilibrium hardly at all. Productive capacity is so far ahead of the current rate of consumption that in no department of the trade has there been any tension. Here and there pits made a half-hearted resumption on the Thursday in Christmas week. Generally speaking, the holiday was maintained till Monday.

There was no serious interference with transport from the weather. Delays due to railway congestion and withdrawal of trucks to meet the heavy traffic in Christmas merchandise were soon overtaken, and this week the distributive branches have settled down smoothly.

Only in the best descriptions of domestic coal has there been any suggestion of stringency. Difficulty of keeping abreast of orders in the department was speedily overcome. Nothing has occurred to transfer the market control from the buyer to the seller.

DIARIES, CALENDARS, &c.

From the following firms further seasonable gifts in the form of diaries, calendars, and other office requisites are acknowledged:

Alder & Mackay, Ltd., New Grange Works, Edinburgh.
Brotherton & Co., Ltd., City Chambers, Leeds.
Cambridge Instrument Company, Ltd., 45, Grosvenor Place, London, S.W.
Carless, Capel, & Leonard, Hope Chemical Works, Hackney Wick, London, E.
"Chemical Trade Journal," 265, Strand, London, W.C.
Clay Cross Company, Ltd., near Chesterfield.
Darien Press, Bristo Place, Edinburgh.
Davison & Partner, Ltd., 11, Carteret Street, Queen Anne's Gate, London, S.W.
Dougall's Gas Meters, Ltd., Chiswick Mall, London, W.
Gas Purification and Chemical Company, Ltd., Palmerston House, Old Broad Street, London, E.C.
Hazell, Watson, & Viney, Ltd., 52, Long Acre, London, W.C.
Partridge & Cooper, Ltd., 191-192, Fleet Street, London, E.C.
Simon-Carves, Ltd., 20, Mount Street, Manchester.
Stanton Ironworks Company, Ltd., near Nottingham.
Wilkes & Co., Ltd., 41-47, Friar Street, Southwark, London, S.E.

TRADE NOTES.

Messrs. Drakes, Ltd.

Messrs. Drakes, Ltd., of Halifax, have received a contract from the Bingley Urban Council for the installation of a carbonizing plant, with coal-handling apparatus; and from the Bristol Gas Company a contract for the reconstruction of one horizontal retort house.

"Centriflovane" Grit Catchers.

During the past year the Tipton Tub and Tube Company, Ltd., Engineers, of Tipton, Staffs., have installed at a gas-works one of their patent "Centriflovane" grit catchers at the base of a brick chimney which is working in conjunction with horizontal boilers.

Peebles Gas-Works Governors.

Messrs. Peebles & Co., Ltd., have issued a new catalogue dealing with all forms of gas-works governors as manufactured by them. The Company have been producing gas appliances now for nearly three-quarters of a century, and the experience gained is embodied in their manufactures to-day. Their latest designs in station governors comprise those for self-loading, pressure loading by air or gas, and loading by clock. The great benefit of pressure loading, it is claimed, is that heavy pressures can be dealt with without increasing the depth of the seals; and only very small weights are required. The "B.V.R." governors for retort house work are the firm's latest production. These are relay governors which may be adapted to control any condition of vacuum or pressure, and are simple in action. All the firm's products are made by skilled workmen, and are thoroughly tested before despatch.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Dec. 19.]

Nos. 36,310—37,162.

AITKEN, R.—"Gas burners." No. 36,539.
BEUTHNER, K.—"Removing distillation products from gas producers." No. 36,530.
BRITISH BRASS FITTINGS, LTD.—"Gas adjusting devices for gas injectors." No. 36,654.
CHILOWSKY, C.—"Cooling gas purifying apparatus." No. 36,999.
EVANS, E. V.—"Apparatus for carbonization of coal." No. 36,443.
ILLINGWORTH CARBONIZATION COMPANY, LTD.—See Evans, E. V. No. 36,443.
ILLINGWORTH, S. R.—See Evans, E. V. No. 36,443.
IMRAY, O. Y. (NAAMLOOZE VENNOOTSCHAP SILICA EN OVENBOUW MIJ).—"Coke ovens." No. 37,140.
KLONNE, A. [FIRM OF].—See Beuthner, K. No. 36,530.
KOPPERS COMPANY.—"Coking retort ovens." No. 36,988.
PEEK, FREAN, & CO., LTD.—See Aitken, R. No. 36,539.
SOUTH METROPOLITAN GAS COMPANY.—See Evans, E. V. No. 36,443.
SPERRYN, G. N.—See British Brass Fittings, Ltd. No. 36,654.
UNION CHIMIQUE BELGE SOC. ANON.—"Purification of coke oven gas." No. 36,963.
WEST, E. & F. J.—"Coke extractors for vertical retorts." No. 37,011.
WEST'S GAS IMPROVEMENT COMPANY, LTD.—See West, E. & F. J. No. 37,011.

Experimental Gas Plant at Cassel.—An experimental gas plant for the gasification of lignite has just been opened in Cassel by a Company formed in Berlin, under the title of Braunkohlengas Gesellschaft, G.m.b.H. The plant, which has been established at the Cassel Gas-Works, is producing gas from 20 tons of brown coal daily.

Parkinson & W. & B. Cowan, Ltd.—At an Extraordinary General Meeting of the Company on Jan. 9, the following resolution will be submitted: "That the name of the Company be changed from Parkinson & W. & B. Cowan, Ltd., to Parkinson & Cowan, Ltd., and that application be made to the Board of Trade to sanction such change."

Falk, Stadelmann Annual Concert and Dance.—There was an attendance of about 450 persons at Messrs. Falk, Stadelmann's annual concert and dance, held on Friday, Dec. 21, at Falk's "Veritas" Incandescent Works, Wandsworth. The Chairman and Directors of the Company, as well as a large number of guests from the Head Office at Farringdon Road, were present.

Proposed Extensions at Exmouth.—A meeting of stockholders in the Exmouth Gas Company was held on Wednesday, Dec. 19, for the purpose of considering the draft of an application to the Board of Trade in connection with the extension of the gas-works and the acquisition of a new site on the foreshore near the docks. The Chairman of Directors, Mr. E. T. Linscott, said that owing to the great growth of their business there was an immediate necessity for increased gasholder accommodation. The present site, owing to its shape and restricted area, did not offer the facilities for the putting-down of any type of gasholder, and the Directors had arrived at their decision after a careful study of the question for several years, and having called in expert advice. In regard to opposition by owners of property in the vicinity of the site, Mr. Linscott observed that the Company had every desire to preserve the amenities of the neighbourhood, and wished to retain the goodwill of their customers and of the inhabitants generally. The stockholders approved the Board's action by a considerable majority.

Bilston Gas Light and Coke Company Report.—In the eighty-third annual report of the Directors of the Bilston Gas Light and Coke Company, which will be submitted to the shareholders on Jan. 7, it is stated that the profit and loss account, after payment of interim dividends, shows a credit balance of £15,358. It is proposed to pay, on Jan. 7, further dividends of 5s. 6d. per share on the "A" shares, less tax, and 4s. per share on the "B" shares, less tax (making, with the interim dividends paid in July last, 11s. and 8s. per share respectively, less tax, for the year). The Directors have transferred £593 to the renewal fund; £593 to the special purposes fund; and, subject to the approval of the stockholders, will transfer £945 to the reserve fund, leaving thereafter a balance of £11,079. The Directors report that, despite the low price of residuals, they were able to reduce the price of gas, as from April 1, 1928, by 3d. per 1000 c.ft. for all purposes. Under the date Aug. 3, 1928, a Special Order under the Gas Regulation Act was made, giving to the Company authority to increase its borrowing powers, and giving powers for other purposes.

Ludlow Gas Company Sue Local Firm.—At the Ludlow County Court, before Judge Ivor Bowen, K.C., the Ludlow Gas Company brought an action against Bodenham & Sons, Buttercross, Ludlow, for gas supplied, hire of meter, and meter testing fee—a total of £28 15s. 7d. Defendants paid £12 10s. into Court, and denied liability. Mr. J. F. Bourke, for the plaintiffs, pleaded that he had a *primâ facie* case by Act of Parliament, which said that readings of meters were evidence of consumption. It was for the defendants to prove that consumption had not taken place. Mr. W. C. Tyrrell, for the defence, said that it had been impossible for the Gas Company to find out how much gas had been used, for one meter did not register at all, and the other meter had been broken in transit when it was going to be tested. Mr. Bodenham, the defendant, explained that he thought he had been overcharged by £15. In 1926 the Company found that his meter did not register. For a month the figures on the meter did not change. A new meter sent his consumption up considerably. The Judge adjourned his decision, and asked the parties to try to settle the matter.

Will.—Mr. Henry Stinton Smith-Rewse, of the Whessoe Foundry and Engineering Company, Ltd., left £95,426 (net personalty, £94,151).

New Showroom for Llandudno.—The Llandudno Gas Committee are contemplating the establishment of a showroom in a central position in the town, for the display of modern gas appliances.

Satisfactory Progress at Skipton.—The abstract of accounts just compiled for the Skipton Urban Council reveals a satisfactory state of affairs in connection with the gas undertaking, notwithstanding the fact that last year 5 million c.ft. less gas was used. As against the aggregate decrease, more gas (786,000 c.ft.) was employed in street lighting, and 82,000 c.ft. less was used at the works. The financial result for the year ended March last is a credit balance of £11,000, taking into account a loan in the shape of working capital of £3000.

Lighting Trades, Ltd.—The annual Christmas carnival and dance of the employees and friends of Lighting Trades, Ltd., Gas Mantle Factory, Earlsfield, and other depôts, took place on Thursday, Dec. 20, at the Wimbledon Palais de Danse. The dancers numbered nearly 1100, and the hall presented a scene of great gaiety. Valuable prizes were given for fancy dress costumes, and during the evening Mr. H. J. Mitchell, Chairman of the Company, presented long-service awards in the form of silver watches and medals to three employees with more than 25 years' service. The recipients were Miss Rock, of the Earlsfield Mantle Factory, and Mr. Morriss and Mr. Vokins, of Wandsworth Central Stores Depôt.

Woolwich Public-House Explosion Inquest.—An inquest was held by Dr. W. H. Whitehouse, at Woolwich on Dec. 28, on the body of H. K. Banks (28), who was found dead in the bar of the Lord Horwick public-house, Woolwich Road, Charlton, after the explosion which occurred there on Dec. 22. Henry Holt, the licensee, questioned by the Coroner, stated that he was in his office at the time of the explosion, about 6.20 p.m., and he immediately rushed to an adjoining room, which he found in darkness. After the explosion witness saw a light burning near the ceiling in the dart room, and he at once turned off the gas, though neither he nor any other person on the scene smelt the slightest trace of escaping gas. The premises had been thoroughly overhauled by the Gas Company when he took over occupation in June last, and they were satisfied that there was no leakage. Mr. H. M. Brown, Divisional Chief Inspector of the South Metropolitan Gas Company, said that he had formed the opinion that a pendant in the dart room broke, causing gas to circulate through to the dining room, where it was ignited by a hanging lamp. He was surprised that no one had smelt escaping gas. The jury returned a verdict of "Death from a fractured skull caused by an explosion of gas." They were not able, however, to say how the explosion occurred.

The funeral took place on Sunday, Dec. 23, of Mr. John Couch, aged 87, who for over half a century had been employed by the St. Blazey (Cornwall) Gas Company.

During the 24 hours ended 6 a.m. on Christmas Day the Blackburn Corporation Gas Department had a record output of 5½ million c.ft.—250,000 c.ft. more than 1927, which up to then stood as the record.

The Sidmouth Urban District Council have decided that their gas and electricity undertakings shall be managed separately as from March 31 next, and will meet to consider the conditions under which the respective posts of Gas Manager and Electricity Manager are to be held.

A gas explosion occurred on Christmas Day in the office and warehouse of Messrs. Burns & Harris, printers, of Dundee, as a result of which considerable damage was done. During the night, gas had been escaping; and, the Gas Department having been notified, workmen attended. About 8.30 a.m., while they were trying to trace the leakage in the adjacent courtyard, an explosion occurred in the warehouse and office. An outbreak of fire ensued, which, however, was quickly extinguished by the fire brigade.

A verdict of "Death from misadventure" was returned at an inquest, on Dec. 24, on Rose Ephgrave, of Sutton, who was found dead in a bath. Medical evidence showed that death was due to carbon monoxide poisoning. It was said that the water was heated by a gas copper, which was moved from the scullery into the bathroom. Owing to the smallness of the room, the products of combustion did not escape. The necessity of a chimney to take the products outside was emphasized by the Coroner.

A verdict of "Accidental death" was returned at the inquest on Mr. and Mrs. Walter Barrett on Dec. 21, who were found dead in bed at Brentford a fortnight previously. An inspector from the Gas Light and Coke Company stated that he had examined the gas service in the bedroom, and all the taps were in good order. A gas radiator, however, was found to burn incorrectly through insufficient air being admitted. The register of the coal grate was closed, which prevented the products of combustion being carried off.

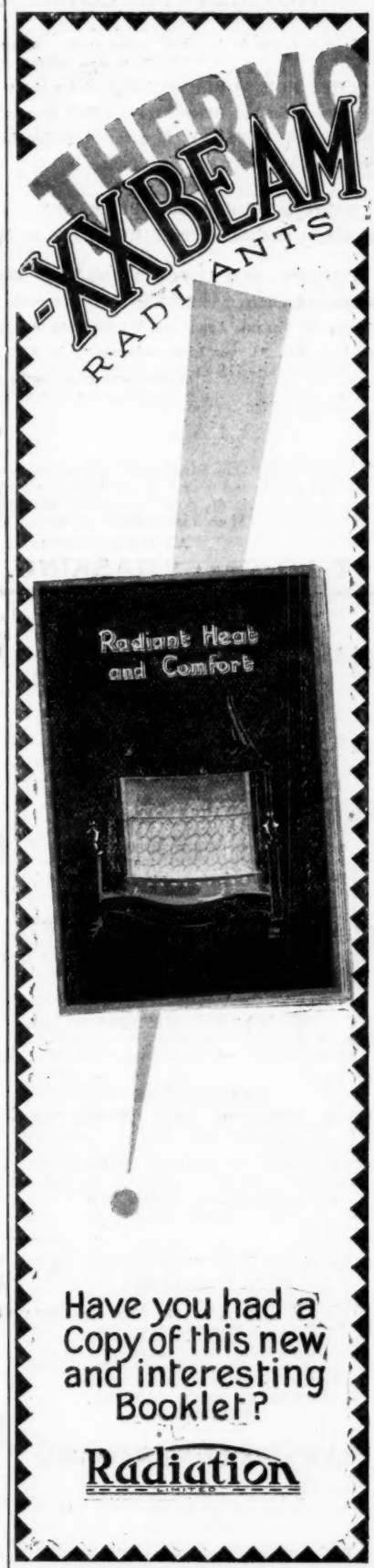
By an advertisement in the local Press the Deal and Walmer Gas Company advocate the use of their gas-works coke as a preventive of smoke and soot, and for labour-saving in the home. Deal gas coke, they state, is produced in continuous vertical retorts from best South Yorkshire and Derbyshire nuts having a low ash content averaging under 5 p.ct. The prices, which operate from Dec. 31, 1928, are: Coke over 1¼ in. screen or ¾ in. fork, 28s. 4d. per ton; and broken and graded coke for stoves, &c., over ¾ in. screen up to 1¾ in. nuts, 1s. 8d. extra.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. Dec. 28.	Rise or Fall on Week.	Transactions Lowest and Highest during the Year 1928.
£			%p.a	% p.a.				
171,978	Stk.	Aug. 30	5	5	Aldershot 5 p.c. max. C. .	72—77	..	70—77½
412,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	69—72	..	70—72
1,551,868	,,	Sept. 27	7	7½	Alliance & Dublin Ord. .	96—99	..	93½—99
374,000	,,	July 12	4	4	Do. 4 p.c. Deb. . .	68—66	..	63—66½
623,654	,,	Aug. 30	7	7	Barnet Ord. 7 p.c. . . .	114—117	..	106½—116½
300,000	1	Oct. 11	1/7½	1/4½	Bombay, Ltd.	20/—22/-	..	21/—23/6
170,000	10	Aug. 30	8½	8½	Bournemouth 5 p.c. . . .	12½—13½	..	12½—13½
500,050	10	,,	7	7	Do. B 7 p.c. . .	12½—13	+½	12—12⅞
375,000	10	,,	6	6	Do. Pref. 6 p.c. .	11—11½	..	10⅞—£11/6/9
50,000	Stk.	July 12	3	3	Do. 3 p.c. Deb. .	56—59	..	56½—57
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	75—78	..	76—78
357,900	,,	Aug. 30	7½	7½	Brighton & Hove 6 p.c. Con.	115—118	..	111½—118½
341,880	,,	,,	6½	6½	Do. 5 p.c. Con.	101—104	..	99½—107
1,387,500	,,	July 26	5	5	Bristol 5 p.c. max. . . .	91½—92¼a	..	..
855,000	,,	Sept. 27	7	8	British Ord.	115—118	..	111½—117½
100,000	,,	Dec. 20	7	7	Do. 7 p.c. Pref. . . .	112—115*	..	112—116½
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	73—76*	..	72½—77
200,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	93—96*	..	95½—96
100,000	10	Dec. 6	8	6	Cape Town, Ltd. . . .	7½—8½	..	8⅞—9
100,000	10	Oct. 25	4½	4½	Do. 4½ p.c. Pref. . .	6½—7½	..	6½—7⅞
150,000	Stk.	Dec. 20	4½	4½	Do. 4½ p.c. Deb. . .	71—76*	..	73—76
426,860	,,	July 26	6	6	Cardiff Con. Ord. . . .	97—100	..	97—101
287,860	,,	June 28	7½	7½	Do. 7½ p.c. Red. Deb. .	100—103	..	102—103
157,150	,,	Aug. 16	6½	5	Chester 5 p.c. Ord. . . .	88—93b	..	89—90b
79,185	1	Oct. 11	†2/-	†2/-	Colombo Ltd. Ord. . . .	36/—38/	—5/-	31/6—43/-
24,495	1	,,	1/4‡	1/4‡	Do. 7 p.c. Pref. .	21-/—23/-	..	20/9—22/10½
378,402	1	Oct. 11	1/9‡	1/9‡	Colonial Gas Assn. Ld. Ord	24/—26/-	..	23/1½—25/6
187,848	1	,,	1/7‡	1/7‡	Do. 8 p.c. Pref.	21/—23/-	..	21/—22/-
2,073,280	Stk.	July 26	7	5	Commercial Ord. . . .	98—101	..	94—101
475,000	,,	Dec. 20	3	3	Do 3 p.c. Deb. .	56—59*	..	57—60
800,000	,,	Sept. 27	11	11	Continental Union, Ltd. .	105—110	—2½	28—110
200,000	,,	,,	7	7	Do. 7 p.c. Pref. .	102—107	+7	92—95½
187,560	,,	Aug. 16	7	7	Croydon sliding scale . .	110—113	..	100½—113
103,100	,,	,,	5	5	Do. max. div. . . .	84—87	..	82—87
492,270	,,	Aug. 16	10	7	Derby Con.	115—120a	..	..
55,000	,,	Dec. 20	4	4	Do. Deb.	70—74c*	—1	..
209,000	,,	Aug. 30	5	5	East Hull Ord. 5 p.c. . .	75—78	..	78½—79½
1,002,180	10	Sept. 13	16	14	European, Ltd.	9½—10	+⅛	7½—9½
18,708,480	Stk.	July 26	5/1/4	5½	Gas Light & Coke 4 p.c. Ord.	18/1½—18/7½f	—/6	18/3—19/10½
2,500,000	,,	,,	3½	3½	Do. 3½ p.c. max. . . .	63—65	+½	62—65
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. .	78—81	..	76½—81
5,602,820	,,	Dec. 20	3	3	Do. 3 p.c. Con. Deb. .	59—61*	..	59—62½
181,816	,,	,,	6	6	Do. 6 p.c. Br'tf'd Rd. Db.	102—105*	..	102—106*
1,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	98—100*	..	98½—101½
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb. .	..	..	..
82,500	,,	Aug. 30	6½	7	Hastings & St L. 5 p.c. Conv	95—100	..	91½—92½
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	75—80	..	69½—77½
70,000	10	Oct. 11	†10	†10	Hongkong & China, Ltd. .	13—14	..	13½—14½
178,200	Stk.	Aug 30	5	5½	Hornsey Con. 3½ p.c. . .	88—91	..	77½—80½
1,976,000	,,	Nov. 8	10	10	Imperial Continental Cap.	195—205	..	145—203
228,180	,,	Aug 16	3½	3½	Do. 3½ p.c. Red. Deb.	67—69	..	67½—70
235,242	,,	Aug. 16	7	7½	Lea Bridge 5 p.c. Ord. . .	116—121	..	96½—120½
2,145,907	,,	Aug. 16	5½	5½	Liverpool 5 p.c. Ord. . .	90½—91b	..	87½—93b
600,000	,,	Sept 27	7	7	Do. 7 p.c. Red. Pref.	101—102b	..	101⅞—105b
165,736	,,	Aug. 16	8	9	Maidstone 5 p.c. Cap. . .	124—129	+2	109—128
63,480	,,	Dec. 20	3	3	Do. 3 p.c. Deb. . .	54—57*	..	53½—57
75,000	5	Dec. 6	18	18	Malta & Mediterranean .	5½—5⅝	..	5½—5⅞
841,920	Stk.	Nov. 22	†7	15	Montevideo, Ltd. . . .	95—97	..	92—98½
2,061,315	,,	Aug. 16	5	5	Newcastle & Gateshead Con.	16/3—17/3df	+-/3	...
350,999	,,	,,	4	4	Do. 4 p.c. Pref. .	71½—72½d	..	..
691,705	,,	Dec. 20	8½	8½	Do. 8½ p.c. Deb. .	68—69d*	..	..
131,780	,,	Aug. 30	6/18/0	7/1/0	North Middlesex 6 p.c. Con.	102—107	..	93½—105½
300,000	,,	Nov. 22	7	9	Oriental, Ltd.	112—115	..	108½—120
188,120	,,	Dec. 20	7½	8	Plym'th & Ston'house 5 p.c.	108—111*	..	104—106½
414,500	,,	Aug. 30	7½	7½	Portsm'th Con. Stk. 4p.c. Std.	109—112	..	102—110
336,732	,,	,,	5	5	Do. 5 p.c. max.	79—82	..	78—81½
3,334,464	1	—	—	—	Primitiva Ord.	25/6—27/6	..	20/—29/6
244,500	100	Dec. 8	4	4	Do. 4 p.c. Red. Deb. . .	91—94	..	91½—95
695,000	Stk.	July 26	4	4	Do. 4 p.c. Red. Deb. 1911	79—81	..	75—80½
416,345	,,	Dec. 20	4	4	Do. 4 p.c. Cons. Deb. . .	78—80*	..	75—78½
150,000	10	Sept. 27	6	6	San Paulo 6 p.c. Pref. . .	8½—8⅝	..	8½—8⅞
270,000	Stk.	Aug. 30	6	6½	Sheffield A	104—105e	..	..
419,968	,,	,,	6	6½	Do. B	104—105e	..	..
1,047,000	,,	,,	6	6½	Do. C	104—105e	..	..
90,000	10	June 14	‡3	‡4	South African	4—6	..	4—5½
5,609,895	Stk.	July 26	7½	5	South Met. Ord.	106½—108½	..	103—108½
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	110—113	..	110½—113
1,495,445	,,	July 12	3	3	Do. 3 p.c. Deb. . .	59—61	..	59—62
784,000	,,	Sept. 13	6½	6½	Do. 6½ p.c. Red. Db.	100—102	..	100—103
91,500	,,	Aug. 16	8½	8½	South Shields Con. . . .	109—110d	..	..
1,343,795	,,	July 26	6½	6½	South Suburban Ord. 5 p.c.	108—111	..	104—110
968,837	,,	Dec. 20	5	5	Do. 5 p.c. Deb.	96—99*	..	94½—101
647,740	,,	Aug. 30	5	6	South'mpton Ord. 5 p.c. max.	77—79	..	77½—80½
121,278	,,	Dec. 20	4	4	Do. 4 p.c. Deb.	71—74*	..	75
350,000	,,	Aug. 30	7	7	Swansea 7 p.c. Red. Pref. .	101—103	..	100½—105
900,000	,,	Dec. 20	6½	6½	Do. 6½ p.c. Red. Deb.	99—101*	..	100—102½
120,000	,,	July 26	7½	8	Tottenham District A 5 p.c.	117—122	..	107—121½
882,276	,,	,,	6½	6½	Do. B 3½ p.c.	100—103	..	91½—103
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	96—99	..	99—99½
181,365	,,	Dec. 6	4	4	Do. 4 p.c. Deb.	75—78	..	74½—79
299,094	,,	Aug. 30	6⅝	6⅝	Uxbridge, Maidenhead, & Wycombe 5 p.c. . . .	93—98	..	88—96½
88,880	,,	,,	5	5	Do. 5 p.c. pref. .	87—92	..	85—92
90,000	,,	July 12	8½	8½	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c. .	130—135	..	127—128
355,536	,,	,,	7	7½	Do. B 3½ p.c. .	113—118	..	110—115½
492,535	,,	,,	5/19/0	6½	Do. C and New	99—104	..	97—102½
352,000	,,	,,	6⅝	6½	Do. Wimbledon 5 p.c. .	107—112	..	106—112
98,000	,,	,,	7⅛	7⅛	Do. Epsom 5 p.c. . .	117—122	+2	112½—119½
100,000	,,	,,	5	5	Do. 5 p.c. Pref . . .	88—91	..	89½
88,416	,,	Dec. 20	3	3	Do. 3 p.c. Deb. . . .	56—59*	..	57—59⅜
284,743	,,	,,	4	4	Do. 4 p.c. Deb. . . .	75—78*	..	76—78
207,500	,,	,,	5	5	Do. 5 p.c. Deb. . . .	96—98*	..	99—100

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. ‡ For year.



CLARK'S NEW PATTERN
"SEVERN" COOKER
A combined gas-heated oven and griller for flats and small houses. Oven has WHITE-ENAMELLED DOOR.
CLARK'S SYPHON STOVE CO., LTD.
164-172, QUEEN VICTORIA ST., LONDON, E.C.4

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON TUESDAY, to ensure insertion in the following day's issue.

Orders to Alter or Stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Monday.

UNDISPLAYED ADVERTISEMENTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum, 4s. 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

(Continuous Subscribers are entitled to a free copy of the "GAS JOURNAL" CALENDAR and DIRECTORY.)

		ONE YEAR.	HALF-YEAR.	QUARTER.
United Kingdom & Ireland	Advance Rate:	35/-	18/-	10/-
	Credit Rate:	40/-	21/-	11/6
Dominions & Colonies & U.S.A. Payable in Advance		35/-	—	—
Other Countries in the Postal Union. Payable in Advance		40/-	22/6	12/6

In payment of subscriptions for "JOURNALS" sent abroad, Post Office Orders or Bankers' Drafts on London only are accepted.

All Communications, Remittances, &c., to be addressed to WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.

Subscribers who desire to avail themselves of the reduction in the Subscription by paying in advance for the current Year are reminded that this can only be done before the end of January.

THE "GAS SALESMAN."

The "GAS SALESMAN" is included as a supplement to the "JOURNAL" eighteen times a year—twice a month from October to March, and once a month from April to September. Additional copies are also obtainable at the following rates: Annual Subscription **6/-**, post free, payable in advance. Single copies (by post) **4½d.** In Bulk for Distribution among Gas Service Staffs—100 copies of each issue, **30/-**; 50 copies, **16/-**; 25 copies, **8/-**; 12 copies, **4/-**, all plus carriage.

All communications to WALTER KING, LTD., 11, BOLT COURT, FLEET STREET, E.C. 4.

Telegrams: "GASKING, FLEET LONDON." Telephone: Central 6055.

GAS PURIFICATION & CHEMICAL CO., LTD.,
PALMERSTON HOUSE, 34, OLD BROAD STREET, LONDON, E.C. 2.

OXIDE OF IRON
AS SUPPLIED BY THIS COMPANY FOR OVER 50 YEARS ON SALE OR LOAN.

SPENT OXIDE
PURCHASED IN ANY DISTRICT.

Telegrams: "PURIFICATION, STOCK, LONDON." *Telephone:* LONDON WALL, 9144.

GAS WORKS STEAM PLANT.
We can meet your requirements for BOILERS, RECEIVERS, TANKS, WASHER TUBES, SIZING SCREENS, PLATE WORK, BOILER SETTINGS, CHIMNEYS (brick and steel).
INQUIRIES INVITED.
H. & T. DANKS (NETHERTON) Ltd., NETHERTON DUDLEY.
(See illustrated page advert., Centre p. XI., Dec. 26.)

SATURATORS
FOR producing Long Needle-like CRYSTALS; also plant for producing NEUTRALIZED SULPHATE.
THE CHEMICAL ENGINEERING AND WILTON'S PATENT FURNACE Co., Ltd., 76, Victoria Street, London, S.W. 1.
(See also advertisement, Centre p. VIII.)
Telephone: VICTORIA 2417. Telegrams: "EVAPORATOR PHONE LONDON."

WEIGHBRIDGES
FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.
CHARLES ROSS, LIMITED, SHEFFIELD.

"LUX" PURIFYING MATERIAL.
THE PREMIER MATERIAL FOR GAS PURIFICATION.

THOS. DUXBURY AND CO.
SOLE AGENTS FOR ENGLAND, SCOTLAND, IRELAND, WALES AND THE COLONIES (except CANADA).
16, DEANSGATE, MANCHESTER. *Telegrams:* "Darwinian, Manchester." *Tel. Nos.:* 8269-9 City.
PALACE CHAMBERS, WESTMINSTER, S.W. 1. *Telegrams:* "Darwinian, Parl, London." *Tel. Nos.:* 6601-2 Victoria.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.
WET AND DRY GAS METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 815 Oldham, and 2412 Hop, London.
Telegrams: "BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

MEWBURN, ELLIS, & CO.,
CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C. 2.
Telegrams: "Patent, London." Phone 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
99, LONDON ROAD, LEICESTER.
Telegrams: "BRIPURIMAT, LEICESTER." Telephone: LEICESTER 5096.
Solicit enquiries for:—
NATURAL BRITISH PURIFYING MATERIAL,
NATURAL HYDRATED OXIDE OF IRON,
FIRST QUALITY DUTCH BOG ORE,
BEST QUALITY BELGIAN BOG ORE,
"PREPARED" AND "UNPREPARED" ARTIFICIAL OXIDES.
SPENT OXIDE PURCHASED.
LONDON OFFICE: 34/35, NORFOLK STREET, STRAND, W.C. 2.
Telegrams: "BRIPURIMAT ESTRAND LONDON." Telephone: CENTRAL 3932.

PATENTS for Inventions, Trade Marks. Advice, Handbooks and Consultations free. KING'S PATENT AGENCY LTD., Director B. T. KING, C.I.M.E., Regd. Patent Agent, G.B., U.S., and Can., 146A, QUEEN VICTORIA ST., E.C. 4, and 57, CHANCERY LANE (near Pat. Off.), LONDON, W.C. 2. 40 years' refs. 'Phone Cent. 0682

SULPHURIC ACID.
SPECIALLY prepared for the manu- facture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD., with which is amalgamated WM. PEARCE & SONS, LTD., 36, Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN LONDON."
Telephone—ROYAL 1166.

GEORGE WILSON GAS METERS, Ltd. for GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS
(See special advertisement, p. 16),
Foleshill Road, COVENTRY.
Telephone: 596. Telegrams: "GASMETER."
Cerium Works, Kingston Road, Raynes Park, LONDON, S.W. 20.
Radium Works, 12, Radium Street, Oldham Road, MANCHESTER.

OXIDE OF IRON.
SPENT OXIDE BOUGHT.
BALE & CHURCH, LTD., 33, ST. MARY AT HILL, LONDON, E.C. 3. Phone: Royal 1484.

"TORTO" FIRE CEMENT.
BALE & CHURCH, LTD., 33, ST. MARY AT HILL, LONDON, E.C. 3. Phone: Royal 1484.

"KLEENOFF," THE COOKER CLEANSER.
Tins for Sale to Consumers.
In Bulk for Works Use.
(See "Gas Salesman," p. 296.)
BALE & CHURCH, LTD., 33, ST. MARY AT HILL, LONDON, E.C. 3. Phone: Royal 1484.

APPOINTMENTS, &c., VACANT.

HIGH-GRADE Practical Engineer required by well-known Firm of Bye-Product Plant Specialists connected with Gas-Works and Coke-Oven Industry. Combined Mechanical and Chemical Training with Technical Ground Work Essential. Preference given to Man with Initiative, and able to take full Responsibility for Design and Improvements on Plant and performance of Guarantees. A future is assured for Man with right Qualifications. Age limit, between 30 and 45 Years.

Apply, stating Age, Experience, and Salary required, to No. 7913, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

COUNTY BOROUGH OF BLACKPOOL.
(GAS DEPARTMENT.)

WANTED—A Shift Engineer, fully acquainted with Glover-West Vertical Retorts. Eight hours day. Relief shift each week. Salary commencing £250 per Annum, with three increments to £330 per Annum, subject to Deductions under the Local Government and other Officers' Superannuation Act, 1922. Medical examination necessary.

Applications, accompanied by *copies* of three recent Testimonials and stating Age, Qualifications, and Particulars of Training, to be addressed to the undersigned not later than the 21st of January, 1929.

JOHN H. CHEW, Engineer and Manager.

Gas Offices, Princess Street, Blackpool, Dec. 29, 1928.

SALESMAN required by well-known firm of Gas-Works Chemical Plant Specialists on a Salary and Commission Basis. Preference given to one with Technical Experience in this line and with Existing Live Connection.

Apply, stating Age, Experience, Qualifications, and Salary required, to No. 7912, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

ROBERT DEMPSTER & SONS, Ltd., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. Telegrams: "DEMPSTER, ELLAND." Telephone: ELLAND 261 (Private Branch Exchange).

EXTENSIONS and Renewals. Ask us to quote before ordering GAS APPARATUS, COKE-OVEN PLANT, STRUCTURAL STEELWORK. Competitive prices. First-Class Workmanship. Satisfaction Guaranteed.
FIRTH BLAKELEY, SONS, & CO., LTD., CHURCH-FENTON, YORKSHIRE.

APPOINTMENTS, &c., VACANT.

(Continued.)

A GENTLEMAN required calling regularly upon Gas Companies, for a very profitable Side Line, on a Good Commission Basis. Please state, when replying, ground covered.
Address, No. 7915, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WELL-Known London and Provincial Coal Distributing Firm is desirous of appointing to their Staff a SALESMAN who has Influence with Gas Engineers and can Introduce Important Tonnages.
Write, "H.D.," c/o J. W. VICKERS & CO., LTD., 24, AUSTIN FRIARS, E.C. 2.

APPOINTMENTS, &c., WANTED.

EXPERIENCED Lecturer and Demon- STRATOR in Cooking by Gas can give LOCAL DEMONSTRATIONS for Gas Undertakings.
Gas Engineers should apply now for vacant dates to Miss H. H. TUXFORD, M.C.A., "WESTWOOD," TATTERSHALL, LINCOLN.

PLANT &c., FOR SALE & WANTED.

PLANT FOR SALE.

PURIFIERS.—Rubber jointed covers, Valves, etc. Two Sets of Four, 10 ft. square. Two sets of Two 10 ft. square. Two sets of Two 8 ft. square, water lutes, valves, etc.
Meters.—Two Rectangular Station Meters fitted with New Drums 15,000 c.ft. per hour capacity. Cylindrical Station Meters, 10,000, 5000, 4000, 3600 and 2000 c.ft. capacities.
Station Governors.—Parkinson, Cowan, and Peebles, 4 in., 5 in., and 8 in.
Retort Ironwork for beds of 4's, 5's, 6's, 7's, and 8's. 22 in. by 16 in. Self-Sealing Mouthpieces. 6 in. Ascension Pipes and all to follow.
Washers and Tar Extractors.—Livesey and Cripps, 100,000, 200,000, and 250,000 c.ft. per day capacities.
Holmes Brush Washer Scrubber 250,000 per day. Steam-Engine Driven.
Exhausting Sets.—Steam and Gas Engine-driven, 5000 to 40,000 c.ft. per hour capacity.
Storage Tanks.—Large number in Stock (Rectangular and Cylindrical). Tar Stills, &c.
Tar and Liquor Pumps, Steam and Belt-Driven.
Air Receivers, Fans, Blowers, Valves, Rivetted Tubes.
Firth Blakeley, Sons, & Co., Ltd.
(Second-hand Plant Dept.),
Vulcan Ironworks, Church-Fenton, Leeds.
Telephone: 14, South Milford. Telegrams: Blakeleys, Church-Fenton.

GAS-WORKS Plant. We Purchase, for Dismantling, for Re-Use or Scrap, any DISCARDED PLANT or IRONWORK. Best prices, prompt removal by experienced staff, covered by insurance for all risks.
FIRTH BLAKELEY, SONS, & CO., LTD., Second Hand Plant Department, CHURCH-FENTON, *via* LEEDS.

PURIFIERS for Sale—
Set of Eight—Two 32 ft. by 20 ft. / Four 20 ft. by 20 ft. / Two 20 ft. by 18 ft. 9 in. } all 5 ft. deep.
Water Lutes, with Covers and Overhead Cranes, Valves, Pipes and 12-in. Connections complete.
Apply to the ENGINEER, GAS-WORKS, SOUTHAMPTON.

CITY OF CHICHESTER GAS COMPANY.

FOR SALE—Half Ton per diem Sul- PHATE OF AMMONIA PLANT, complete and extra One-Ton STILL.
For further particulars apply:
T. N. RITSON,
Engineer and General Manager.
Gas-Works,
Chichester.

TALK O' TH' HILL COLLIERY, LTD.

MISCELLANEOUS PLANT FOR SALE.

THREE "Holmes" Rotary Brush WASHERS (2 million c.ft. capacity).
Two "Dempster" CAST IRON SCRUBBERS (65 ft. high by 9 ft. diameter).
Two WATER TUBE GAS COOLERS (capacity 1½ million c.ft.)
150 yards 18 in. STEEL and CAST IRON MAINS and VALVES.
Lee Howl PUMPS—various sizes.
Store BOILERS, TANKS, and other Miscellaneous GAS WORKS PLANT.
Apply, TALK O' TH' HILL COLLIERY, LTD., TALKE, near STOKE-ON-TRENT.

FOR SALE—Cheap to Clear, recently installed 34 H.P. "NATIONAL" GAS ENGINE E.L. Type Mag, with Pulleys, Belt, Hangers, and Counter Shaft; also KEITH LIGHTING COMPRESSOR, Direct coupled with Motor, with 150 Lights, Shades, and Run of Gas Piping complete.
Apply, W. PICKERING & SONS, LTD., HINCKLEY.

CONTRACTS OPEN.

COUNTY BOROUGH OF WALSALL.
(GAS DEPARTMENT.)

THE County Borough of Walsall Gas Department are prepared to receive TENDERS for the Supply and Erection of a 4-LIFT SPIRAL-GUIDED GASHOLDER, Plans and Specifications for which can be obtained on application to the undersigned, on receipt of a fee of 5 Guineas, which will be returned on receipt of a *bona-fide* Tender.
The Corporation do not bind themselves to accept the lowest or any Tender.
Date for tendering, 21st of January, 1929.
FRED DAVIES,
Engineer and Manager.
Pleck Gas-Works,
Walsall,
January, 1929.

ISSUE OF STOCK.

By Order of the Directors.

HEMEL HEMPSTED DISTRICT GAS COMPANY.

Messrs. A. & W. RICHARDS
are Instructed to OFFER FOR SALE BY TENDER
£6000
SIX PER CENT. REDEEMABLE DEBENTURE STOCK.
Minimum Price of Issue, Par,
to be redeemed at Par on the 1st of January, 1938.
Also
£6000
"C" ORDINARY STOCK,
ranking for a Standard Dividend of 7 per cent. subject to the Sliding-Scale equally with existing "C" Ordinary Stock now receiving this rate.
Minimum Price of Issue, Par.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Wednesday, the 16th of January) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

TROTTER, HAINES, & CORBETT LIMITED
BRETTEL'S ESTATE,
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.
Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.
Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.
SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.
LONDON OFFICE: E. C. BROWN & CO., LEADENHALL CHAMBERS, 4, ST. MARY AXE, E.C.

:: WRITE ::
W. SPENCER & SONS
SOUTHALL, Middx.
FOR PARTICULARS OF
THE MOST EFFICIENT
PATENT GRIDS
Please write for Booklet.

38 YEARS' EXPERIENCE has enabled **"BRISTOL'S"** to offer **THE LARGEST RANGE OF RECORDING INSTRUMENTS,** all characterised by their simple, robust design and accuracy.

Recording Volt, Amp. and Watt-meters. Pyrometers. Time, Speed, Motion. Liquid Level Temperature Control, etc.
BUY BRISTOL'S AND BUY THE BEST Particulars from:
J. W. & C. J. PHILLIPS, LTD.,
23, College Hill, Cannon St., London, E.C. 4.

WEIGHBRIDGES.

When buying Weighbridges, it Pays to buy the Best.

HENRY POOLEY & SON, LTD.
John Bright Street, Birmingham.

"COMBINATION"
SCRAPER AND WIRE BRUSH.

Two Boiler Cleaning Tools in one.

Send for full particulars.
GREEN & BOULDING, Ltd.
162A, Dalston Lane, London, E. 8.

KOPPERS' CHAMBER OVENS.
KOPPERS VERTICAL OVENS.
KOPPERS' REVERSIBLE REGENERATIVE RETORT SETTINGS.
See large Advert. appearing in alternate issues of the "Journal."
For full particulars of the above systems apply to
KOPPERS' COKE OVEN CO., LTD.,
301, Glossop Road,
SHEFFIELD.
Telegraphic Address: KOPROVEN, SHEFFIELD. *Telephone:* BROOMHILL 6006 (3 lines)

CAST IRON PIPES

FOR

GAS, WATER, & STEAM

1¼in. to 12in. BORE.

THOS. ALLAN & SONS, LTD.,
Bonlea Foundry,
THORNABY-ON-TEES.
Telegrams: "BONLEA, THORNABY-ON-TEES."
Telephone Nos.: STOCKTON 321 and 322.

INDEX TO "JOURNAL" ADVERTISERS.

	PAGE
Alder & Mackay, Ltd.	7
Aldridge & Ranken, Ltd.	—
Allan, Thomas, & Sons, Ltd.	57
Anglo-American Oil Company, Ltd.	—
Arden Hill & Co.	—
Ashmore, Benson, Pease, & Co., Ltd.	Wrapper I.
Automatic Light Controlling Co., Ltd.	—
Bagnall, John, & Sons, Ltd.	18
Bagshawe & Co., Ltd.	—
Bale & Church, Ltd.	56
Barrowfield Ironworks, Ltd.	—
Berk, F. W., & Co., Ltd.	Wrapper I.
Blakeley (Firth), Sons, & Co., Ltd.	57
Braddock, J. & J.	Centre IX., 56
Bray, George, & Co., Ltd.	—
British Aluminium Co., Ltd.	—
British Furnaces, Ltd.	—
British Gas Purifying Materials Co.	56
British Industries Fair	4
British Thomson-Houston Co., Ltd.	Centre XI.
Broadbent, Thos., & Son, Ltd.	—
Bromford Tube Co., Ltd.	25
Brotherton & Co., Ltd.	—
Bugden, T., & Co.	—
Burt, Boulton, & Haywood, Ltd.	Wrapper II.
Cambridge Instrument Co., Ltd.	—
Cannon Iron Foundries, Ltd.	17
Carless, Capel, & Leonard	—
Carron Company.	—
Celite Products Corporation	—
Cellactite and British Uralite, Ltd.	—
Chamber Ovens, Ltd.	64
Chapman (Spencer) & Messel, Ltd.	56
Chaseside Engineering Co.	—
Chemical Engineering and Wilton's Patent Furnace Co., Ltd.	Centre VIII, 56
Clapham Bros., Ltd.	—
Clark's Syphon Stove Co., Ltd.	55
Clayton, Son, & Co., Ltd.	67
Cloake, A. G.	—
Cockey, E., & Sons, Ltd.	—
Competition Points for Gas Salesmen	—
Cort, Robert, & Son, Ltd.	8
Cowan, W. & B.	Wrapper III.
Crossley Bros. (Bispham)	62
Crossley Brothers, Ltd. (Openshaw)	—
Cutler, Samuel, & Sons, Ltd.	Centre IX.
Danks, H. & T. (Netherton), Ltd.	56
Davey, Paxman, & Co., Ltd.	—
Davis Furnace Co.	—
Davis Gas Stove Co., Ltd.	21
Davison & Partner, Ltd.	—
Dempster, R. & J., Ltd.	Wrapper I.
Dempster, R., & Sons, Ltd.	Centre II., 57
Donkin Co., Ltd. (The Bryan)	Wrapper II.
Drakes, Limited	Centre VI
Dry Gasholders, Ltd.	—
Duxbury, Thomas, & Co.	56
Economic Gas Boiler Co., Ltd.	9
Economical Gas Apparatus Construction Company, Ltd.	—
Electrolux, Ltd.	—
Ellis, Key, & Co.	60
Evans, Joseph, & Son (Wolverhampton), Ltd.	65
Excelsior Shade Manufacturing Co., Ltd	—
Expanded Metal Company, Ltd.	—
F. C. Construction Co., Ltd.	—
Falk, Stadelmann, & Co., Ltd.	—
Fletcher, Russell, & Co., Ltd.	—
Foster & Pullen, Ltd	66
Fraser & Chalmers Engineering Works	—
Gas Journal	—
Gas Journal Calendar and Directory	59
Gas Meter Co., Ltd.	Wrapper IV., 10
Gas Purification and Chemical Co.	Wrapper I., 56
Gas Salesman	—
Gas Salesman's Diary & Handbook	59
General Gas Appliances, Ltd.	—
Gibbons Bros., Ltd.	19
Gibbons (Dudley), Ltd.	—
Gledhill-Brook Time Recorders	60
Glenboig Union Fireclay Co., Ltd.	61
Glover, George, & Co., Ltd.	1
Glover, Thos., & Co., Ltd.	26
Goodall, Clayton, & Co., Ltd.	65
Grant, David, & Co.	18
Grantham Boiler & Crank Co., Ltd.	—
Green and Boulding, Ltd.	57
Griffin, John J., & Son, Ltd.	6
Griffiths Bros. & Co. (London), Ltd.	Wrapper I.
Hall, John, & Co., Stourbridge, Ltd.	60
Hardman and Holden, Ltd.	—
Harris and Pearson	59
Head, Wrightson, & Co., Ltd.	Wrapper I., 64
Heathman, J. H.	63
Hislop, R. & G.	60
Holman Bros., Ltd.	—
Holmes, W. C., & Co., Ltd.	—
Holst, K., & Co.	—
Holophane, Ltd.	11
Horseley Bridge and Engineering Company, Ltd.	—
Horstmann Gear Company, Ltd.	—
Hortonspheres	—
Humphreys and Glasgow, Ltd.	24
Hunt and Mitton, Ltd.	—
Hutchinson Bros., Ltd.	—
Jenkins, W. J., & Co., Ltd.	22
Kaye, Joseph, & Sons, Ltd.	—
Keith, James, and Blackman Company, Ltd.	68
Kent, George, Ltd.	—
King, Walter, Ltd.,	59
King's Patent Agency	56
Kinnell, Chas. P., & Co., Ltd.	—
Kirkham, Hulett, and Chandler, Ltd.	—
Kleenoff Co..	56
Koppers Coke Oven Co., Ltd.	57
Laidlaw, R., & Son (Edin.), Ltd.	66
Le Bas Tube Co., Ltd.	6
Lead Wool Company, Ltd.	—
Lewis, Edwin, & Sons, Ltd.	—
Lighting Trades Ltd.	13
London Electric Firm	60
Lord, J. E. C. (Manchester), Ltd.	—
Low Temperature Carbonisation, Ltd.	23
Macpherson, Donald, & Co., Ltd.	—
Main, R. & A., Ltd.	Centre VII.
McKelvie, James, & Co.	Wrapper I.
Mewburn, Ellis, & Co.	56
Midland Flexible Metallic Tubing Co., Ltd.	—
Midland Railway Carriage and Wagon Co., Ltd.	Wrapper IV.
Midland Tar Distillers	—
Mitchell, H.	—
Mobberley & Perry, Ltd.	—
Moore, Walter, & Sons	Wrapper I.
New Conveyor Co., Ltd.	2
Newton Chambers & Co., Ltd.	15
Orme, George, & Co.	—
Oughtibridge Silica Firebrick Co.	5
Parkinson Stove Company, Ltd.	Centre III.
Parkinson, W., & Co.	18, 26
Patent Retorts, Ltd.	60
Pearson, E. J. & J., Ltd.	—
Peckett & Sons, Ltd.	64
Peebles & Co., Ltd.	—
Penney and Porter, Ltd.	—
Perfecta Meters, Ltd.	14
Phillips, J. W. & C. J., Ltd.	57
Piggott, Thos., & Co., Ltd.	—
Pocock, Herbert	—
Pollard Engineering Co., Ltd.	—
Potterton, T. (Heating Engineers), Ltd.	—
Pooley, Henry, & Son, Ltd.	57
Premier Gas Engine Co., Ltd.	—
Pulsometer Engineering Company	Wrapper IV
Purimachos Ltd.	—
Quasi-Arc Co., Ltd.	—
Radiation Ltd.	21, 55, Centre IV., V
Rateau Engineers.	11
Reavell & Co., Ltd.	61
Renold, Hans, Ltd.	5
Richmond Gas Stove & Meter Co., Ltd.	—
Riley, A. J., & Son, Ltd.	—
Riley, John, & Sons, Ltd.	—
Robinson, J. H., & Co. (Liverpool), Ltd.	—
Ross, Chas., Ltd.	56
Rotary Meter Company, Ltd.	12
Rotherham and District Collieries Association, Ltd.	62
Ruscoe, John, & Co., Ltd.	60
Sankey, J. H., & Son, Ltd.	12
Sawer & Purves	Centre X.
Scottish Tube Co., Ltd.	62
Sheepbridge Coal & Iron Co., Ltd.	Wrapper IV.
Siebe, Gorman, & Co., Ltd.	60
Smith Meters, Ltd.	—
Solent Engineering Co., Ltd.	—
South Metropolitan Gas Company	61
Spencer-Bonecourt, Ltd.	—
Spencer Chapman & Messel, Ltd.	56
Spencer, W., & Sons (Southall)	57
Stanton Ironworks Co., Ltd.	—
Staveley Coal and Iron Co., Ltd.	3
Stein, J. G., & Co., Ltd.	Wrapper I.
Stewarts and Lloyds, Ltd.	Wrapper I.
Strachan & Henshaw, Ltd.	1
Stringer Bros.	—
Sugg, Wm., & Co., Ltd.	—
Super-Centrifugal Engineers, Ltd.	—
Taylor, Joseph (Saturators), Ltd.	64
Tecalemit, Ltd.	—
Thames Bank Iron Co., Ltd.	—
Thermal Syndicate, Ltd.	—
Tilghman's Patent Sand Blast Co., Ltd.	—
Tilley High Pressure Gas Synd., Ltd.	65
Tipton Tub and Tube Co., Ltd.	9
Torbay Paint Company, Ltd.	Wrapper I.
Town Gas Boilers (Bonecourt), Ltd.	—
Trier Bros., Ltd.	—
Trotter, Haines, and Corbett, Ltd.	57
Tully Sons & Co.	66
Turner Brothers Asbestos Co., Ltd.	—
Turner, F.	—
Vertical Gas Retort Synd., Ltd.	68
Wailes Dove Bitumastic, Ltd.	6
Walker, C. & W., Ltd.	Centre X.
Waller, Geo., & Son, Ltd.	2
Waterless Gasholder Co., Ltd.	—
Wellington Tube Works, Ltd.	—
Welsbach Light Company, Ltd.	—
West's Gas Improvement Co.	Centre XII.
Westwood & Wrights	59
Whessoe Foundry and Eng. Co., Ltd.	—
Wholesale Fittings Co., Ltd.	—
Willey & Co., Ltd.	20
Williamson, Cliff, Ltd.	—
Wilson (George) Gas Meters, Ltd.	16, 56
Wilsons & Mathlesons, Ltd.	—
Woodall-Duckham Co., Ltd.	Centre I.
Wood, Hugh, & Co., Ltd.	—
Wright, Alex., & Co., Ltd.	Centre XI.
Wright, John, & Co.	—

Appointments Vacant & Wanted	56, 57
Company Notice	—
Contracts Open	57
Educational	—
Membership Examination	—
Patent Exploitation	—
Plant for Sale and Wanted, &c.	57
Sale of Gas Works and Plant	—
Stock Issue	57

GAS JOURNAL

LIGHT ⁘ HEAT ⁘ POWER ⁘ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

PROPRIETORS: WALTER KING, LIMITED. OFFICE 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. —— Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXXXV., No. 3425.] WEDNESDAY, JANUARY 9, 1929. [81ST YEAR.

Editorial Notes.

The Industry's Finances.

THE financial side of the industry is laid bare in Part II. of the Board of Trade Return relating to all Authorized Gas Undertakings in Great Britain, the issue of which for 1927 is noticed elsewhere in this number of the "JOURNAL." It is a plain, unvarnished tale, which reveals to the most casual observer how extensive are the claims of the industry to consideration at the hands of the Government. We find represented no fewer than 782 authorized undertakings, supplying so essential a commodity as gas to practically every community of any size in England, Scotland, and Wales, and having a total nominal capital invested of £183,405,321 (including loans borrowed by local authorities, and since repaid). These figures place gas high in importance among the great industries of the country, altogether without any consideration of the leading part which it plays in connection with many other industries upon which the nation depends. More than one-half of the total number of undertakings are in the hands of companies who have a combined paid-up capital, in shares and stock, amounting to £88,581,757, and loan capital issued (including debenture stock) of £26,135,262. The local authorities possess, as already mentioned, fewer undertakings; but they, too, have a large financial stake in the industry; for the total amount of money borrowed by them for their gas undertakings is £68,688,302—the amount of loans repaid and balance in sinking fund being £37,330,482.

These Board of Trade Returns are, of course, freely used for comparative purposes, and on the present occasion it is necessary to bear in mind that the figures, though in every case covering twelve months, embrace in each instance different periods. Thus, while the local authorities in England and Wales obtained a net profit of £1,570,918 during the year ended March 31, 1928, there was a deficit incurred by the Scottish local authorities of £1,125,524 in the twelve months ended May 15, 1927—the financial period to which the Return is made up. In the latter case the coal stoppage of 1926 was a strongly influencing factor. Deducting the Scottish deficit from the profit made in England and Wales, there is left a net profit for all local authority undertakings of only £445,394. The companies' figures are for the calendar year 1927, and they show a profit of £7,310,891. This is an increase when compared with the preceding year of £3,488,338, nearly all of which has resulted from reduced expenditure.

As has been pointed out, the Return furnishes financial details of the operations of authorized gas undertakings having a total nominal capital of £183,405,321 (including loans borrowed by local authorities, and since repaid), and one would search in vain for any sign of decay. So far from that being evident, progress is being made all along the line; but it is felt—and rightly felt—that this progress would be even more rapid were the industry free to expand without restraint. Such accelerated progress would be of benefit, not alone to the industry, but also to the millions of consumers, large and small, who depend upon it for one of the prime needs of civilized life.

A Check to the Ruhr High-Pressure Scheme.

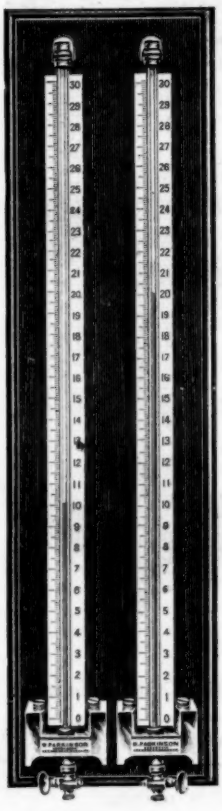
A FEW weeks ago an esteemed German correspondent, for whose authority to write on German gas affairs we can vouch, gave in our columns an account of recent developments in the plans of the German Coal Syndicate to supersede the existing gas industry by a general supply of high-pressure gas from the Ruhr coke ovens. In this issue he keeps us up to date with the latest happenings; and those whose sympathy is with the "little man," as personified in the individual gas undertaking, against the all-devouring dragon of the Ruhr mains, will no doubt read his title with some misgiving. But a perusal of the article will reveal that the latest step towards general high-pressure distribution in Germany is that the little man has been able to make a very astute move, and call "check" on a highly important line of advance.

The story is well worth reading, as an excellent example of the general intrigue which at present centres round the gas supply of Germany. In brief, it is as follows: A large gas undertaking buys a colliery, in order to make itself independent of Ruhr supplies. The colliery is of necessity a member of the Coal Syndicate, and pays a fixed levy on all its sales into the pool. But colliery consumption and coal used by subsidiaries are exempt from all or part of the levy. So the gas undertaking divides itself into two—a manufacturing and a distributing concern. It presents to the colliery a 51 p.ct. shareholding in the manufacturing side, which therefore becomes a subsidiary of the colliery for purposes of levy-free coal. But this is not all. Present-day political opinion in Germany is strongly opposed to the owning of public utility services by private enterprise, and the State and provincial authorities own the highways where new mains are required. So they have to be won over by being given a holding in the new organization. Out of all this is evolved an example of what is known in Germany as group or regional gas supply. This is the counter-proposal of the gas industry to the Ruhr scheme. It advocates, in effect, a certain degree of centralization, and high-pressure dis-

No Home is complete
without the comfort given by
Gas Service

No Gas Service is complete
without the security given by the
Thomas Glover Meter

Advertisement of Thomas Glover & Co., Ltd.



PARKINSON'S

SINGLE TUBE GAUGES

One Pattern, Interchangeable.
Pressure, Vacuum, Differential.
Scale starts from
ZERO
Inches of Water
Inches of Mercury
lbs. per sq. in.

W. PARKINSON & CO.,

INCORPORATED IN PARKINSON & COWAN (GAS METERS), LTD.

COTTAGE LANE, CITY ROAD, LONDON, E.C.1.	BELL BARN ROAD, BIRMINGHAM.	MORNINGTON STREET, ORMEAU ROAD, BELFAST.
Telegrams: "INDEX, ISLING, LONDON."	"GASMETERS, B'HAM."	"PREPAYMENT, BELFAST."
'Phone Nos.: 4270 Clerkenwell	2245 Midland, B'ham.	3374 Belfast.